

MARINE REVIEW.

VOL. V.

CLEVELAND, OHIO, THURSDAY, MARCH 3, 1892.

No. 10.

Contract Freight Matters.

A feature of interest in the freight market is a contract for the transportation of a block of Marquette ore running throughout the season at \$1.15 a ton. This rate is in proportion with the figure of \$1.25 from the head of Lake Superior, although it was thought some time ago, when the feeling as to freights was stronger than at present, that Marquette shippers would be compelled to pay a contract rate almost equal to that ruling from Ashland, on account of the indications of low water and a light movement in coal to Marquette. As far as can be learned, only one Marquette contract has been made, however, and it is between a vessel owner and the purchaser of the ore. The market for pig iron is still depressed under increasing stocks and no indications of improvement in prices. Ore shippers operating lines of vessels running to Escanaba and Marquette have undoubtedly provided for their own tonnage to some extent and have made agreements with certain owners to whom a stated amount of business is guaranteed on the basis of rates that may be fully established in the future, but there is no ore to come from these places offered to outside boats. A change in the relations between the ore producers and the pig iron makers, who are placed at a disadvantage on account of the condition of the iron market, must come about before more chartering can be looked for from Escanaba or Marquette. Not more than half a dozen boats were placed at the dollar rate from Escanaba when \$1.25 was first paid from Ashland, and it is more than probable that tonnage could now be secured at 95 cents or possibly a slightly lower figure. There is no ore offering now from Ashland at \$1.25, and boats wanting single cargoes of grain from Duluth at 4 cents are unable to secure them, although there is no talk of shading these rates.

Following the establishment of 50 cents as the contract rate on coal to the head of Lake Superior a few boats were placed for first trips in the spring at a like rate. Nothing has been done in coal freights to Lake Michigan.

Lumber is Largely Carried by Rail.

Were it not for the development of timber lands tributary to the lakes in Minnesota and Wisconsin and the great increase in lumber shipments from the head of Lake Superior during the past few years, vessels engaged in the business of carrying lumber on the lakes would fare badly. With the steady decline in the pine industry of the Saginaw valley and the increasing tendency to make shipments by rail, on account of a saving in handling charges, the vessels have been getting only a small portion of the lumber trade, as compared with water transportation in other lines. The following figures show the total lumber production on the Saginaw river in years named, and the water and rail shipments, in feet:

| | Feet cut. | Water shipments. | Rail shipments. |
|-----------|-------------|------------------|-----------------|
| 1885..... | 728,498,221 | 659,665,000 | 149,672,900 |
| 1886..... | 798,826,224 | 591,013,100 | 176,500,000 |
| 1887..... | 783,661,265 | 486,185,000 | 261,900,000 |
| 1888..... | 880,669,440 | 451,391,000 | 304,362,500 |
| 1889..... | 851,623,133 | 432,130,000 | 352,500,000 |
| 1890..... | 815,054,465 | 409,972,000 | 401,847,000 |
| 1891..... | 758,610,548 | 404,577,000 | 405,258,000 |

This table shows the diversion of more than one-half of the the Saginaw river output from water to rail transportation.

Affairs in Admiralty.

BIG STEAMERS DO NOT OWN THE WATERWAYS.

The federal courts seem determined that vessels of high speed shall not be run to the disadvantage of smaller craft in narrow channels. Judge Lacombe of the circuit court of appeals, second circuit, hands down a decision of interest in this regard in a case appealed from the United States circuit court for the southern district of New York. The ocean steamship Majestic, passing up New York bay, when near Bedloe's island overtook and passed a tug with a heavily laden canal boat lashed on either side. A displacement wave produced by the steamship, 3 feet or more high, struck the tug and threw her with such force against one of her tows as to break in the side of the tow. The officers of the steamship testified that she passed the tug half a mile to the westward and that her speed had been 11 or 12 knots an hour but was reduced to 7 knots at a point below Bedloe's island. The weather was fine and the bay smooth and there was nothing to render navigation of the bay by the tug or her tows on that day imprudent. The court held that the steamship was liable for the injuries to the tow, and that it was no defense that her displacement waves did not render navigation in the bay more perilous for tugs and tows than would a high wind, nor that she was navigating at a speed customarily adopted by vessels of her class. The tug was not in fault for failure to turn the stern of her tows directly to the wave, she being the overtaken vessel and her master having the right to assume that the steamship would take proper steps to avoid disaster; and this, though the master saw the wave some little time before it struck, as he might reasonably expect a decrease in the wave before it would reach his vessel.

The steamship Thingvalla when in mid-ocean discovered the white light and both side lights of an approaching steamship, the Geiser, so situated as to indicate to the navigator of the Thingvalla that the two vessels would meet end on, or nearly so. The Thingvalla altered her course to starboard in order to keep out of the way, and continued to swing to starboard, although the red light of the Geiser disappeared indicating that she was swinging in the same direction, until, although the engines of both were reversed, they came into collision. Circuit Judges Wallace and Lacombe of the court of appeals, second district, held that whether the two vessels were meeting end on, or on crossing courses, in either case, the change of course of the Geiser was in violation of rules 16 and 23, requiring her to port if meeting end on and to hold her course if on crossing courses; and that, as the navigator of the Thingvalla did not know but that the Geiser would change her course so as to conform to the rules, she was not in fault for not changing her course to port as soon as she saw the mistaken maneuver of the Geiser.

The circuit court of appeals, second circuit, on hearing a short time ago a case appealed from the United States court, eastern district of New York, reduced a salvage award and held that, although the amount of salvage rests in the discretion of the court awarding it, an appellate court may reduce the award, if in making it there was a clear and palpable mistake, violation of just principles or a departure from the path of authority. The case was that of a vessel at anchor in New York harbor, laden with petroleum in wooden cases which took fire and which, but for the prompt services of tugs which came to her assistance, would have been totally destroyed in a few moments. The saving to the owners was ascertained to be \$81,400, and \$20,000 was awarded to the tugs as salvage. The vessel was of iron and iron rigged. The salvors encountered no peril to person or property, and the extinction of the fire required no extraordinary exertion on their part. The salvage award was pronounced excessive and was cut down to \$12,000.

Among the holders of maritime liens equal in dignity he shall be preferred who first institutes proceedings to enforce his claim.



Built by the DETROIT DRY DOCK CO.

Supplement to MARINE REVIEW, Cleveland, O.

FERRY STEAMER ST. IGNACE.

CHICAGO LAKE INTERESTS.

WESTERN OFFICE, MARINE REVIEW,
No. 210 So. Water Street, CHICAGO, ILL., Mar. 3.

Secretary Coffin of the Minnesota Iron Company, with whom your correspondent had a brief talk a few days ago, is inclined to the opinion that the iron companies will not bid up current contract rates for carrying ore. The business will drift along he says, awaiting a turn of affairs in the sale of pig iron. If that branch of the iron trade improves, boats may get better than contract figures on wild charters. Otherwise they will get much less. The American Steel Barge Company has contracted to carry 150,000 tons of ore from Two Harbors to South Chicago. The whalebacks will carry grain to Buffalo on their return trips.

To those who doubt the utility of the Detroit deep waterways convention, attention is called to the remarkable prominence the lake marine has attained. You see more about lake commerce, lake channels in the leading newspapers now than ever before. It is a campaign of education, and the people, who are now being educated, will at last speak. Unsatisfactory as the Detroit convention was in some respects, its fruit is nearly all that could have been desired. It can rightly be pronounced a distinguished success.

The tug companies have turned the tables on the silk stockings who have started out to banish smoke by resolution. Capt. Dunham has written the new Society for the Prevention of Smoke, that he would like to have its expert show him how his tugs can burn soft coal, do their work and not smoke at times. The expert will make the trial, but it is safe to predict that the aforesaid expert will look very wise, talk very big, and the tugs will still smoke. It was a clever move this throwing the responsibility on the other fellow. Experts on smoke are generally quite expert in drawing a salary.

In the purchase of the steamer Puritan from Graham & Morton of Chicago the Northern Michigan line has secured a very good sea boat. She has made a heap of money for the Graham & Morton people, being the first steamer to engage in a real excursion traffic out of Chicago. Her place will be taken by a chartered steamer until the new steamer now building at Detroit is ready for service.

At a meeting held at the office of William Penn Nixon, where the Inter Ocean, Times, Tribune, and Herald were represented it was decided to incorporate the Lake Marine News Association, which will be a sort of associated press of the papers around the lakes. Mr. Nixon will undoubtedly be the president of the new organization.

The John W. Moore and James Pickands were the last boats to be chartered here. They received 3½ cents for wheat to Buffalo, including storage.

Additional Appointments of Officers.

More appointments of masters and engineers are presented here. The list will be reprinted next week and owners and masters who have not sent in their appointments as yet will be favoring the REVIEW by doing so at once.

MITCHELL & Co., CLEVELAND, O.: Steamers—W. F. Sauber, Capt. C. B. Galton, Engineer C. J. Love; George T. Hope, Capt. N. B. Nelson, Engineer George E. Blauvelt; William H. Gratwick, Capt. C. Peterson, Engineer T. B. Parker; R. L. Fryer, Capt. M. P. Parsons, Engineer Edward Guy; John Mitchell, Capt. W. H. Cowin, Engineer Nelson Goulette; Edward Smith, No. 1, Capt. B. D. Townsend, Engineer Joseph Lavley; Edward Smith, No. 2, Capt. David Carrier, Engineer Henry Graves. Schooners—New boat building at West Bay City, Capt. K. A. Jensen; Maria Martin, Capt. William Rouvel; Angus Smith, Capt. L. P. Smith; Troy, Capt. Jefferson Williams; R. L. Fryer, Capt. Bert Mitchell; S. E. Marvin, Capt. William Brines; C. J. Filmore, Capt. N. C. Kendall.

MINNESOTA STEAMSHIP COMPANY, CLEVELAND, O.: Steamships—Mariposa, Capt. G. B. Mallory, Engineer Alonzo Arnold; Maritana, Capt. F. D. Root, Engineer George Waterbury; Masaba, Capt. J. P. Cottrell, Engineer W. F. Sauber; Marina, Capt. R. R. Graves, Engineer S. H. Miller; Matoa, Capt. A. M. Graves, Engineer J. H. Finley; Maruba, Capt. F. H. Hoffman, Engineer George Arnold; Mariska, Capt. Alex. McFarlane, Engineer R. L. Peck; Manola, Capt. C. H. Bassett, Engineer J. F. Derrig.

PENNINGTON, B. L., CLEVELAND, O.: Steamers—C. B. Lockwood, Capt. R. Jollie, Engineer J. B. Miller; Spencer, Capt. John B. McMannus, Engineer C. W. Stedman. Schooner B. L. Pennington, Capt. C. Lockwood.

WINSLOW, R. K., CLEVELAND, O.: Steamers—Wocoken, Capt. J. D. Mullen; Cormorant, Capt. F. S. Lawton, Engineer Shannon. Schooners—Pelican, Capt. Willard Rodgers; Charles Wall, Capt. James Sheehan.

MILLEN, J. W., DETROIT, MICH.: Steamers—Iron King, Capt. William Millen, Engineer Oscar Snyder; Iron Duke, Capt. Norman Miner, Engineer Jacob Zahy; Iron Chief, Capt. Sydney Miller, Engineer J. Randall; Iron Age, Capt. W. Irwine, Engineer J. Herrner; Greyhound, Capt. Wm. McKay, Engineer Geo. Lawrence. Schooners—Iron Queen, Capt. L. Leonard; Iron State, Capt. W. W. Carter; Iron Cliff, Capt. Thos. Fitzsimmons; Iron City, (no appointment).

INTER OCEAN TRANSPORTATION COMPANY, MILWAUKEE, WIS.: Steamers—Maryland, Capt. J. E. Yax, Engineer S. C. Davis; Manchester, Capt. Timothy Kelley, Engineer James Grant; Manhattan, Capt. H. F. Loftus, Engineer William D. Turnbull; Merrimac, Capt. W. J. Pringle, Engineer W. B. Patterson; Massachusetts, Capt. P. A. Anderson, Engineer William Ahern; Minnesota, Capt. Daniel Jones, Engineer W. H. Pinkham. Schooner Metacomet, Capt. W. L. Shields.

CHAPMAN, W. E., SANDUSKY, O.: Steamers—Chauncey Hurlbut, Capt. A. C. Reimers, Engineer George Marquart. Schooners—D. K. Clint, Capt. C. H. Woodford; S. L. Watson, ————: A. J. Rogers, ————.

RHODES, R. R., CLEVELAND, O.: Steamers—Neshoto, Capt. W. H. Humphrey, Engineer Edward Jenkins; Neosho, Capt. Cyrus Millard, Engineer Thomas Malloy; R. R. Rhodes, Capt. F. P. Houghton.

BENHAM, C. E., CLEVELAND, O.: Steamers—H. B. Tuttle, Capt. C. A. Benham; E. S. Pease, Capt. Thomas Sloan. Schooners—H. C. Richards, Capt. W. P. Benham; Queen City, Capt. Gabriel Knight; Zack Chandler, Capt. Thomas Skinner; Planet, Capt. B. C. Gray. Tug E. M. Peck, Capt. E. Detliffs.

WHITE W. J., CLEVELAND, O.: Steamers—Quito, Capt. George Bessant; Britannic, Capt. Ira B. Mansfield; Say When, Capt. Joseph D. Todd, Engineer Schuman.

DURAND, HOMER, TOLEDO, O.: Steamer St. Paul, Capt. H. Durand, Engineer William Robinson. Schooners—P. B. Locke, Capt. J. A. Moore; Anna P. Grover, Capt. G. L. Durand; Scotia, ————.

GRAHAM & MORTON LINE, CHICAGO, ILL.: Steamers—New boat building at Detroit Capt. Edward Stines, Engineer Robert McClure; City of Chicago, Capt. Charles McIntosh, Engineer William McClure.

HEBARD, CHARLES, PEQUAMING, MICH.: Steamer Charles Hebard, Capt. James Parsons, Engineer William Shoemaker. Schooners—Aloha, Capt. Alfred Eade; Annabelle Wilson, Capt. B. Hursley.

MORLEY, C. T., MARINE CITY, MICH.: Steamers—St. Lawrence, Capt. I. A. Nicholson, Engineer Andrew Manion; John J. Hill, Capt. John Andrews.

VANCE, F. L., MILWAUKEE, WIS.: Steamers—F. L. Vance, Capt. Marion Tinney; R. P. Flower, Capt. C. M. Davis.

AMERICAN TRANSPORTATION COMPANY, FAIRPORT, O.: Steamers—Alex. Nimick, Capt. A. H. Reed, Engineer P. H. Doyle; John Harper, Capt. H. L. Mills, Engineer ————.

SINCLAIR, A. R., PORT HURON, MICH.: Steamers—Simon Langell, Capt. Alex. R. Sinclair, Engineer Anthony Rein; Kalkaska, Capt. H. Fist, Engineer George Miller. Schooner Arenac, Capt. Henry Davis.

JACKSON, G. K., BAY CITY, MICH.: Steamer D. Leuty, Capt. John S. McNeil, Engineer S. Stone. Schooners—G. K. Jackson, Capt. Curtis Jackson; R. Bottsford, Capt. John Lovell.

WHITAKER B. & SON, DETROIT, MICH.: Steamer Byron Whitaker, Capt. Patrick Ryan, Engineer Jacob Sutter. Schooners—S. V. R. Watson, Capt. George M. Kunna; Unadilla, Capt. H. H. Hickmott.

CLOSE G. W., BERLIN HEIGHTS, O.: Steamer C. W. Elphicke, Capt. Chas. Z. Montague, Engineer Alex. Bain.

Proposing a Test of Cylinder Packing.

EDITOR MARINE REVIEW:—The packing of the cylinders of steam engines while one of the most important questions presented to the consideration of engineers, is yet one about which the greatest difference of opinion prevails, every engineer, with any pretensions to authority on the subject, having some pet theory in support of which he is at all times ready to take off his coat and fight.

The problem ought to be easy of solution, for the most ultra-theorist must admit that the best packing is that which produces under all conditions and all degrees of pressure a tight piston with the least friction.

Being firmly convinced that the best method of settling the question is by practical demonstration, which would establish a standard for the guidance of engineers and others interested, the manufacturers of the St John packing will place in your hands the sum of one thousand dollars (\$1,000), other manufacturers of piston packing desiring to compete to deposit an equal amount, the total to be held subject to the result of a test made by a committee of experts selected from the American Society of Mechanical Engineers, or some similar association.

When the decision is rendered, the owner of the packing pronounced superior, to be repaid the amount of deposit, and the balance, after deducting the cost of such test, to be donated to promote the advancement of engineering science.

D. DEKREMEN, Sales Agent,
280 Broadway, New York, N. Y.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

| Stocks. | Par Value. | Bid. | Asked. |
|--------------------------------------|------------|---------|----------|
| Cleveland-Cliffs Iron Company..... | \$100 00 | \$..... | \$ 80 00 |
| Champion Iron Company..... | 25 00 | | 70 00 |
| Chandler Iron Company..... | 25 00 | 47 50 | 49 50 |
| Jackson Iron Company..... | 25 00 | | 105 00 |
| Lake Superior Iron Company..... | 25 00 | | *56 00 |
| Minnesota Iron Company..... | 100 00 | 80 00 | 82 00 |
| Pittsburg Lake Angeline Iron Co..... | 25 00 | 150 00 | |
| Republic Iron Company..... | 25 00 | 23 00 | 24 50 |
| Ashland..... | 25 00 | | 60 00 |
| Section Thirty-three..... | 25 00 | | 8 00 |
| Brotherton..... | 25 00 | 2 00 | 2 75 |
| Iron Belt..... | 25 00 | 2 40 | 2 75 |

* Ex. rights.

Reports of fires at both the Chandler and Republic mines created some anxiety among stockholders during the past week, but the loss in either case has been found to be of little importance. Timbering in No. 3 shaft of the Chandler was partially burned out, but there is a positive statement from the management to the effect that the loss will not exceed \$25,000 and there will be no restriction in shipments of ore. At the Republic the loss was confined to the air compressor house and it is said to be very small. Transactions in stocks are very light and there is little in the way of dividends to encourage trading. The Pittsburgh & Lake Angeline company paid \$4 a share last week, making the total so far in the company's year, which ends June 30, \$21 a share. It is probable, of course, that this great mine will in the three remaining months of the year pay the additional \$4 a share, bringing the total up to last years record of \$25 a share. A division of some portion of the profits of the Champion company had been expected, but an entire plant of new and more powerful machinery is being put in at the mine.

Odanah Mining Company is the name of a corporation that recently secured control of the properties known as Carey and West Carey, Gogebic range. The value of the lease, as represented by the transfer made a few days ago, is \$52,300. Pickands, Mather & Co. of Cleveland are the sales agents of the new company, which has evidently acquired control of these properties with a view to increase their development.

The Minneapolis Iron Company of Minneapolis, Minn., is among the companies organized lately to control Mesaba lands. The capital is \$3,000,000 and the incorporators are George L. Becker of St. Paul; A. R. McGill, Carmon N. Smith, E. M. Mabie and John J. Ankeny, all of Minneapolis; Walter S. Milner of Excelsior, Minn.; John McKinley of Duluth and A. E. Humphreys of Charleston, W. Va.

Lake Underwriters.

All of the general lake agencies were represented at a meeting held in Buffalo, Tuesday, and it was decided to continue running the vessel register as heretofore, under the management of Capt. Daniel McLeod, with headquarters at Buffalo. In order to get the register out by April 1, as was thought best, last year's volume is to be carefully revised by Capt. McLeod, with the assistance of Capt. S. V. Parsons of Buffalo and Capt. William G. Keith of Chicago. Capt. McLeod has been following up the repairs and new work so closely that the April issue of the register will be reliable for all practical purposes. The inspections that may be found necessary will be recorded in the first supplement, which will come out a month later. Work on the revision will be commenced at once. The following officers of the Inland Lloyds were elected for the ensuing year: David Vance of Milwaukee, president; Eugene Harbeck of Detroit, vice-president; H. S. Sill of Buffalo, secretary and treasurer; W. J. Sandrock of Buffalo, Amasa Fitch and C. A. Macdonald of Chicago, and J. J. Clark of Detroit, members of executive committee.

"Informal discussion was had on the subject of hull rates," says the Buffalo Courier, "and it is possible that a meeting may be held hereafter to attempt to bring about some uniformity in that direction. Although it seemed to be conceded that it would be impossible to get all the agents to abide by an agreed schedule during the busy part of the season, it was believed, by a few at least, that it would be well to have some sort of agreement for a starter. The general idea was that rates ought to be about the same as last season."

The Ice-Crusher St. Ignace.

BUILT BY THE DETROIT DRY DOCK COMPANY, DETROIT, MICH.

Attention is attracted just at present to the ferry steamer St. Ignace, which has been making regular trips across the Straits of Mackinac winter and summer for several years, on account of information that the Detroit Dry Dock Company has contracted with the Michigan Central, Grand Rapids & Indiana and the Duluth, South Shore & Atlantic railroad companies to build a larger and more powerful boat on the same plans. The St. Ignace is believed to be the only vessel of the kind in the world and as the boat has no trouble in making her way through from three to five feet of ice, the new steamer carries with it the suggestion of a polar expedition. The St. Ignace is 230 feet over all, 53 feet wide and 25 feet molded depth. The two stern-wheel engines are 28½ and 53 by 48 inches stroke and the two bow-wheel engines are 26 and 48 by 42 inches. Her hull is 30 inches thick, steel sheathed. The new steamer will be 300 feet over all, 52 feet beam, 25 feet molded depth and will have 17 feet draft of water. She will have a propeller in each end, same as the St. Ignace, and be driven by separate compound engines, having a total capacity of 4,000 horse power. Four double-end boilers will furnish the steam for the main engines and the many auxiliaries, winches, capstans, electric lighting plants, etc. The auxiliary engines in the St. Ignace number twenty.

The additional size and engines will give the new steamer 40 per cent. more carrying capacity and one-third more power. She will be housed in to protect the cars from heavy weather, and accommodations for the crew will be on the upper deck. The contract price is said to be \$325,000. The dry dock company will give the St. Ignace an overhauling as soon as the new boat is put in commission. The first cargo carried over the Straits by the St. Ignace was eight locomotives of seventy tons each.

A Steam Yacht for Mark Hopkins.

In addition to the steel excursion steamer for V. Doller, Put-in Bay, the Detroit Boat Works has a contract for a wooden steam yacht for Mark Hopkins, St. Clair, Mich. This work together with the manufacture of smaller craft and yawls gives the yard a busy appearance. The steam yacht will be 102 feet on water line, 120 feet over all, 16½ feet wide and 7 feet deep. Her engines will be the same size as those of the Doller boat, 9½, 14 and 24 by 14 inches, and they will have a Deane independent condenser. A Roberts water tube boiler will furnish the steam. Something handsome and speedy may be expected, judging from other yachts turned out at this yard. It is said that the Idler, built by the boat works, will try a Cain wheel when she comes out this spring.

Detroit Dry Dock Company's "Straightback."

For some time past the Detroit Dry Dock Company of Detroit, Mich., has been engaged on plans for a very large steel freight steamer called a "straightback," and it is now announced that a boat of this pattern, 360 feet over all, 34½ feet keel, 42 feet beam and 24 feet moulded depth, will be built at the Wyandotte yard of the company for Messrs. Selwyn, Charles A., John F., Charles F. and Newell A. Eddy and John Shaw of Bay City, who recently purchased the big steel steamer E. C. Pope. The price is understood to be \$235,000. Original plans for the "straightback" contemplated a boat with a tumble-home to the outer deck, no between decks, a turtle back forward, iron railing instead of bulwarks, and all houses aft, including the pilot house, built up of metal and extending the full width of the vessel, with doors, windows and all exposed parts constructed in a very substantial manner. The hull with increased water bottom and one bulkhead forward is the same at both bow and stern as the present style of vessel built by the Detroit company. Whether these plans will be followed in the vessel now to be built or a new style adopted is not given out as yet.

Lake Protest to the Frye Bill.

Members of Congress and commercial organizations in all parts of the lakes will, within a few days, receive from the Cleveland Vessel Owners' Association copies of a most vigorous protest to the Frye bill, which has already met with opposition from the United States board of supervising inspectors of steam vessels, the Maritime Association of New York and shipping associations throughout the country. The protest of the Cleveland association deals especially with the effects of the proposed legislation on the lakes, and it will be followed later by petitions from all parts of the lakes calling upon members of Congress to defeat the bill. The measure, which was prepared in the treasury department by Capt. L. G. Shepard, J. A. Henriques and Lieut. C. H. McLellen of the revenue marine, to whom all objections will now be referred, is based on the recommendations of the International Marine Conference, but widespread objection to it will certainly result in defeat in Congress, if not in the committee on commerce of the Senate, to which it has been referred. The protest of the Cleveland Vessel Owners' Association, which was prepared by a special committee, consisting of H. H. Brown, James Corrigan, M. A. Bradley, C. B. Calder, Thomas Fitzpatrick, H. D. Goulder, Captains James Stone, William S. Mack and George P. McKay, and adopted by a unanimous vote of the association, is as follows:

Your committee has given the entire bill very careful study. So far as it relates to sea-going ships we do not express any definite opinion, not being sufficiently familiar with the practical details of the construction, equipment, handling, and business of vessels engaged in that service. We do not hesitate to say that there is manifested throughout the bill a like want of familiarity and experience on the part of its framers with the character of the lake commerce and its necessities, growing out of the quick dispatch in port and the frequency of the trips made, the short distances between ports of safety and repair, as well as with the practical details of the construction, equipment, handling, management and maneuvering of the vessels now in use upon the lakes. Such an experience of many years has convinced us that there is need of less rather than of more regulation of these matters. In the main the present system of inspection works well, but there are many details of it which could be dispensed with with safety to the public generally, and with convenience and profit to the owners and managers of our vessels. This is especially true of the immense fleet of steamers and barges used exclusively in the freighting business carrying bulk cargoes of grain, iron ore and coal. Cheap as the rates are for lake transportation the rate must depend to an appreciable extent on the freedom of these vessels from inconvenience, delays and expense which bring with them no compensation in added safety. In this connection it is plain that the kind of inspection provided for steam boilers in this bill would require at least two days for each steamer to be taken out of the busy season, and would require more than double the present force of inspectors to accomplish the work in such a district as our own.

Our first ground of protest then is, that the bill interferes with the rights of the owners, officers and crews of every class of vessels employed on the lakes in respects very much beyond the present requirements of the government, and that in no particular is there need for such additional regulations or legislation. It adds unnecessarily and unjustly to the expense of operating these vessels, makes unreasonable and unnecessary requirements as to qualification in the men who gain their livelihoods on these vessels, puts unnecessary expense upon the owners, involves the government in an enormous annual expense, causes delay to our vessels, puts it in the hands of any disaffected person to bring about a breach of the law in some of its minute details, (as, for instance, with reference to the draft marks) creates a system of espionage, re-establishes the moiety system of dividing fines with informers, a system which was for good reasons long ago abolished in other departments of the government, and so far as our lake commerce is concerned, it is our opinion that the provisions of this bill do not add to the safety or convenience of any one directly or indirectly connected with it.

Your committee does not know and has been unable to find any reason for the inspection by the government of freight tow barges and sailing vessels employed on the lakes, or for regulating their draft of water. We are deeply interested in the safe navigation of our vessels, and owners are in the main quite as competent to determine the proper qualifications in officers and engineers as would be the inspectors required by this law, besides being infinitely more interested than they in the securing of proper officers, engineers and men on board of the vessels. The officers and engineers on our vessels have grown up under the present system, and we venture the opinion that nowhere in the merchant marine of any country can there be found a higher or better class of officers than those on our lake vessels. These men as a class are competent and efficient, have been and are doing their work well and satisfactorily to those having the deepest interest in it, and such requirements as this bill provides would be in the highest degree oppressive and unjust to them, and in a large measure it would be prohibitory to their following their profession.

There are even requirements in this bill that to fill certain positions

on a lake steamer a man should have had training on a sea-going ship; for example, in the case of engineers, as shown in section 150. If that section means what it says, that a man to be chief engineer for machinery of 2,000 indicated horse power, or less, must have served at least three years or five years in a sea-going ship, according to the horse power or her engines, under such a law there are but few engineers who served last season on lake steamers who could qualify, no matter how competent they might be. Nor is there any body of men now serving in lower capacity (whose promotion would have to be strictly according to this bill) from which chief engineers could be recruited. Yet this class includes all of our lake steamers with only a few exceptions. The going into force of such a requirement would actually paralyze our lake business by throwing hundreds of steamers out of commission through denying employment on them to entirely competent and efficient men.

Another objection to the bill is that it puts it in the power and direction of an officer to be appointed under this bill to declare finally and irrevocably how many men shall be employed on a steamer, as well as the qualification of those men; for, as we read the bill, the inspector general has the ultimate disposal of that question. We do not believe that any other business of individuals and corporations, with millions of dollars invested in active legitimate business, in the care and safety of which they are more deeply interested than any others can be, is put under such dictatorial power in an officer of the government. Our experience has taught us that a man who has learned a trade connected with engine building, or who may be able to construct and properly set up an entire engine, is not always a better engineer to operate the engine than one who has been brought up in the engine room of a steamer in the operation of that kind of machinery. On the other hand, some men who have learned and are masters of the trade of machinist or engine builder have proved unsuccessful and inefficient in charge of the operation of marine engines. The members of this committee could, if necessary, instance cases in which this has been true. On account of the accessibility of ports of repair on the lakes, where the tools and facilities for all kinds of repair work are available, our vessels are not provided with facilities for repairing any serious or considerable breakage in machinery. If a machinist were on board competent to rebuild an engine or repair a serious break-down, it would involve a great loss of time and much additional expense to hold the vessels while he should repair it, instead of quickly getting her to a place where repairs could be made with good facilities and with quick dispatch. It is unusual for vessels on the lakes, where customary courses are pursued from point to point, to be even out of sight of some passing craft which can render assistance in towing to a port of safety and repair, and your committee can not now recall an instance where a vessel which has suffered a break-down of her machinery has subsequently been lost or met with further disaster of serious character on that account. Such an instance we believe is unknown on the lakes. We call attention to the above matters as indicating the essential difference between the subjects of sea-going navigation and the use of vessels on our lakes. The two subjects can only be properly dealt with as distinct subjects by separate legislation, if legislation is to reach to any of the particulars and details of their equipment for navigation.

Calling attention now to some specific objections to this bill, they are that section 6 requires regulations for the inspection and equipment of lake and coastwise freight barges being towed and lake sailing vessels, and the officers of such vessels. As a matter of experience and judgment upon experience, we say that this is wholly unnecessary, involving expense, annoyance and delays to the owners of these craft, and a vast annual outlay by the government to no purpose.

That section 33 provides for the marking of the draft of our lake vessels. This is unnecessary. The provision is essentially uncertain, no standard being fixed. The law might be apparently broken in this regard through the malice of anyone who would interfere with the marks, an incentive to causing annoyance and expense being furnished by the division of the fine, one-half to any informer.

The effect of sections 47 and 85 would be, that substantially all the boilers in use on the lakes which have been built in strict accordance with existing laws and regulations, and have been regularly inspected and have been performing well, would be cut down in their working pressure 20 to 30 per cent., a result which would so impair their usefulness as to practically require their abandonment and the substitution of new boilers, which could under the proposed legislation be allowed the necessary working pressure for the type of engines in vogue, and in substituting new boilers of the character required a largely increased weight would have to be carried. The expense and inconvenience of making the change is in itself a sufficient objection when it is considered that the boilers which we have been and are using have proved sufficient and safe in operation.

In the inspection district of Cleveland for the past twenty years, according to a statement from the local inspectors, not a boiler gave out in the riveted seams when being tested.

The board of supervising inspectors of steam vessels in its report to

the secretary of the treasury, under date of Feb. 10, says of this feature of the bill:

"To make our statement as plain and as simple as possible, we will give a few examples showing just what the reduction in working steam pressure in our marine boilers would be under the provisions of the bill."

"To determine the pressure allowable under the bill for any boiler having a cylindrical shell, multiply the working steam pressure allowed by our present law, for such boilers having the longitudinal seam in the shell double-riveted, by .70, the product will give the working steam pressure allowable under the bill. If the longitudinal seams in such boiler are single-riveted, multiply the working steam pressure allowed by our present law by .672, the product will give the working pressure allowable under the bill. For example, a boiler having a cylindrical shell with double-riveted longitudinal seams, allowed under our present law a working-pressure of 100 pounds per square inch, would be allowed 70 pounds under the bill; and such a boiler built so as to be allowed under our present law 150 pound per square inch as a working pressure, would be allowed but 105 pounds per square inch under the bill. If the shell in such a boiler contains single-riveted longitudinal seams, and so constructed as to be allowed 100 pounds per square inch as a working pressure under the law, it would, under the bill, be allowed but 67.2 pounds per square inch; if such a boiler was constructed so as to be allowed 150 pounds per square inch as a working pressure under the law, it would be allowed but 100.8 pounds under the bill."

Sections 37 to 41, inclusive, provide for the inspection of iron and steel plates to be used in the construction of marine boilers. That is not necessary. Practice has demonstrated the law and rules now in force for the inspection of plates and bracing to be all that is necessary.

Section 87 requires a spring safety valve, the springs of which are protected from escaping steam. No such valves are now in use on the lakes and they are not necessary. The valves now in use have answered the purposes, and it would involve great expense to change them. Section 87 also requires that the valve chambers must be bolted to the shell of the boiler. This would be impracticable on boilers having large domes, and objectionable in all cases, as there would be a tendency to blow water with the steam.

Section 147 requires chief engineers to be at least thirty years of age and to have served at least three or five years at sea, according to size of engine. We do not regard the age of thirty years as material if he has reached the age of majority, nor can we say in what respect experience at sea should be required in a man who proposes to run an engine on the lakes and thoroughly knows how to do it.

Sections 148 to 167, inclusive, provide for the examination and classification of engineers. That is not necessary on the lakes, as the engineers that have been raised on the lakes and passed the present standard of examination are capable of performing all the duties that are required of them.

Section 98 provides for a fine of \$100, again to be divided, one-half to the informer. Speaking in regard to this and the other sections of similar import, we desire to call attention to the fact that the movement of our vessels is confined to a period of seven or eight months of the year. During the remainder of the year the vessels, representing an investment of many millions of dollars, lie idle. These and other causes have brought about a system for the rapid handling of cargoes. A temptation is held out to men to complain of vessels for some breach of the details of this law, so timing their complaint that the vessel would be seized, at a time when to take the ordinary measures of defense would result in the detention of the vessel perhaps over night, or from Saturday evening until Monday. A modern lake vessel, representing an investment of over \$200,000, would frequently incur a loss much greater than \$50 or \$100 by delaying until she should be discharged upon bond. The danger would be that a system of petty blackmail might be established. We do not believe that the government ought to again bring into vogue the pernicious moiety system.

Section 179 provides for a system of lights and signals inconsistent with the requirements of lake navigation. For instance, it would be impracticable to carry a light on the stem in the cases of a majority of our lake steamers. In a heavy head-sea the sprays and solid seas would go over it to such an extent that it could not be kept lighted. In spring and fall it would become coated with ice to such an extent as to become useless in even a moderate sea. Again, the only available place for the after light of the range would be above and near the pilot house. The light shining on the forward deck and bulwarks would have the effect to blind the helmsman in the pilot house, and the officer on the bridge as well as the lookout. We say this advisedly because the present masthead light often carried 40 to 50 feet above the deck frequently becomes an annoyance in this regard. The provision that side lights should never be carried forward of the foremast would frequently put those lights aft of the bridge and pilot house, where their effect and usefulness would be in some instances impaired. Besides it would require some fixture along the side of the ship, which would have to be removed in port, and being

movable would be liable to derangement. The present practice is to carry the side lights at the bridge where the vessel reaches her full beam, and they are entirely clear of anything forward of that, and independent of the location of the foremast, which varies considerably in different vessels according to the taste of the owner and the arrangement of the deck plan of the vessel.

Relating to fog signals, we are of the opinion that any such change as recommended in Article VII, page 87, would be to complicate, and hence confuse, thus enhancing the danger rather than tending towards greater safety. Inconvenience and danger arise now from the fact that the single blast has a double office to perform as a fog signal and a passing signal, and we emphatically object to legislation which would give the two blast signal also such a double office, and any attempt at giving a signification to a series of whistle blasts according to their length must lead to uncertainty because of the different notions which men may have as to what constitutes a long or a short signal and the difficulty of blowing them with nice discrimination in moments of excitement and peril.

We also regard the provision as to life and yawl boats for freight steamers unreasonable as to the number of boats and the places to be carried. The present provisions of the law are ample in that respect and no change is necessary.

Your committee finds other objections to the bill as printed, but the same being of the character of those already indicated, we do not specify them particularly, and we recommend that the Cleveland Vessel Owners' Association protest and use all its influence against the passage of the bill under consideration.

A. Milwaukee View of Grain Freights.

Special Correspondence to the MARINE REVIEW.

MILWAUKEE, Wis., March 3—Not a grain charter for spring delivery at Buffalo or any other lower lake point has been made here since the close of navigation. But this is not to be wondered at when the light stocks in store are considered. For instance "regular" elevators on Monday reported, that their bins contained 342,284 bushels of wheat of all grades, 248,571 bushels of barley, 85,571 bushels of rye and 14,681 bushels of oats. There are besides in private elevators 500,000 bushels more, chiefly barley. This is a sorry showing for a city that only a few years ago was noted the country over as the great primary wheat market of the west. Many of the large vessels wintering here are on the market at Chicago for grain cargoes with slim chances of being placed, as the capacity of unchartered vessels wintering there is still placed at between 4,000,000 and 5,000,000 bushels. It is the impression here that engagements at 2½ and 2¾ cents on wheat will soon be reported from the big city because of the pressure to secure engagements.

In a general way there is very little of interest going on in local marine circles just now. Owners of large carriers are hopefully playing a watching game, and profess to see nothing discouraging in their immediate surroundings.

In General.

Plans for consolidating Toledo tug lines have fallen through.

Several actions at law are still pending as a result of the grain blockade in Buffalo last fall. Some of the demurrage claims were settled, but it is probable that half a dozen or more cases held for Cleveland parties by Harvey D. Goulder, proctor in admiralty, will be tried jointly.

Following are dimensions of commerce destroyers No. 12 and 13 to be built for the U. S. navy: Length on load, line 412 feet; beam 58.18 feet; draft, 22.54 feet; displacement, 7,350 tons; coal supply at normal displacement, 750 tons; sustained speed, 21 knots; maximum speed, 22 knots; indicated horse power, 21,000.

In deciding the case of the treasury department against the Vanderbilt yacht Conqueror the United States district court says in substance: "A foreign built ship to be used for commercial purposes can not be imported by an American, nor receive the protection of an American register. A foreign built ship to be used for pleasure purposes may be brought in by an American and is allowed to fly and receive the protection of the American flag, without any payment of duty on the part of the owner."

In answering the question, "What will become of the Saginaw valley when the great white pine manufacturer shall have gone where the woodbine twineth?" E. D. Cowles says in an article recently printed in the Northwestern Lumberman that the pine has been a long time in disappearing and that there is yet vast forests of hardwood available for utility. Advantageous water and rail facilities are building up he holds a large and varied manufacturing business that is more than equal to the loss in white pine.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

JOHN M. MULROONEY, } PROPRIETORS.
F. M. BARTON, }

HOMER J. CARR, - - - Associate Editor and Manager Chicago Office,
210 South Water Street.

Published every Thursday at No. 510 Perry-Payne Building, Cleveland, O.

SUBSCRIPTION—\$2.00 per year in advance. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,510 vessels, measuring 1,063,063.90 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The classification is as follows:

| Class. | Number. | Tonnage. |
|----------------------|---------|--------------|
| Steam vessels | 1,527 | 652,922.25 |
| Sailing vessels..... | 1,272 | 328,655.96 |
| Canal boats..... | 657 | 67,574.90 |
| Barges..... | 54 | 13,910.09 |
| Total..... | 3,510 | 1,063,063.90 |

According to the report of William W. Bates, United States commissioner of navigation, 46 per cent. of the new tonnage of the country was built on the lakes during 1889. This is a percentage greater than the work of the Atlantic coast and western rivers combined, and almost equal to the whole work on the Atlantic and Pacific coast. In 1890 the tonnage built on the lakes is but very little less than that built on the Atlantic and Gulf coasts. Tonnage built on the lakes during the past five years was as follows:

| | No. of boats. | Net Tonnage. |
|------------|---------------|--------------|
| 1886..... | 85 | 20,400.54 |
| 1887..... | 152 | 56,488.32 |
| 1888..... | 222 | 101,102.87 |
| 1889..... | 225 | 107,080.30 |
| 1890..... | 218 | 108,515.00 |
| Total..... | 902 | 393,597.03 |

Entered at Cleveland Post Office as Second-class Mail Matter.

It is not probable that there is any truth in the dispatches from Washington to the effect that the American Steel Barge Company is opposed to the movement for deeper channels in connecting waterways of the lakes, on account of the whaleback barges being of lighter draft than the ordinary type of vessel. If such is the case the influence of even the great barge company will amount to little in a cause of such a selfish nature. Congressman Whiting of Michigan is, however, persistent in his claim that a 20-foot waterway will injure small ports where the depth is not great, and his arguments in this regard may be heeded by those who do not understand the conditions. It might as well be claimed that through freight and passenger trains should not be run between Buffalo and Chicago, because small towns along the line would not be greatly benefited by them. Deep channels mean cheap freights for the whole country and with cheap freights comes cheap food.

WHEN the officers of the revenue marine who prepared the Frye bill read the protest of the Cleveland Vessel Owners' Association to that measure they will probably conclude that many of its provisions are entirely impracticable as regards the lakes. This protest is one of the most forcible arguments that will be presented against the bill. As usual the lake owners take no account of the rules presented for sea-going vessels, but call attention to the peculiar conditions surrounding the lake business and advance a great number of reasons in support of the claim that the two branches of the country's shipping can not be managed under the same laws.

It would seem as though the pay of both officers and men in the life saving service will be increased by the present Congress. The bill has passed the Senate and has been reported favorably to the House by the commerce committee of that body. The increase is not as large as had been expected, as it was cut down in committee to \$900 a year for keepers and \$65 a month for the men.

Grain in Store at Chicago and Duluth.

Following is a statement of stocks of wheat at Chicago on Monday last:

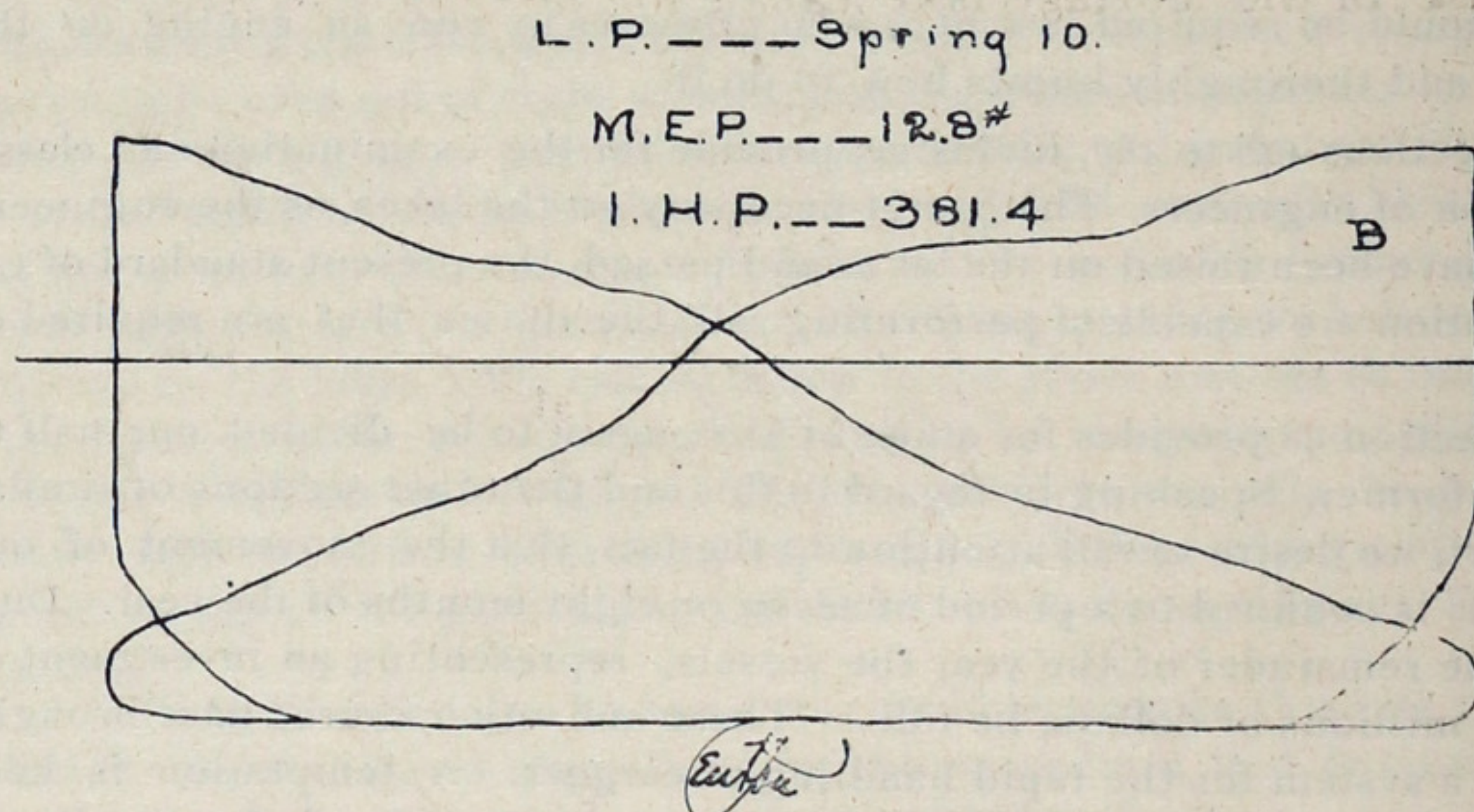
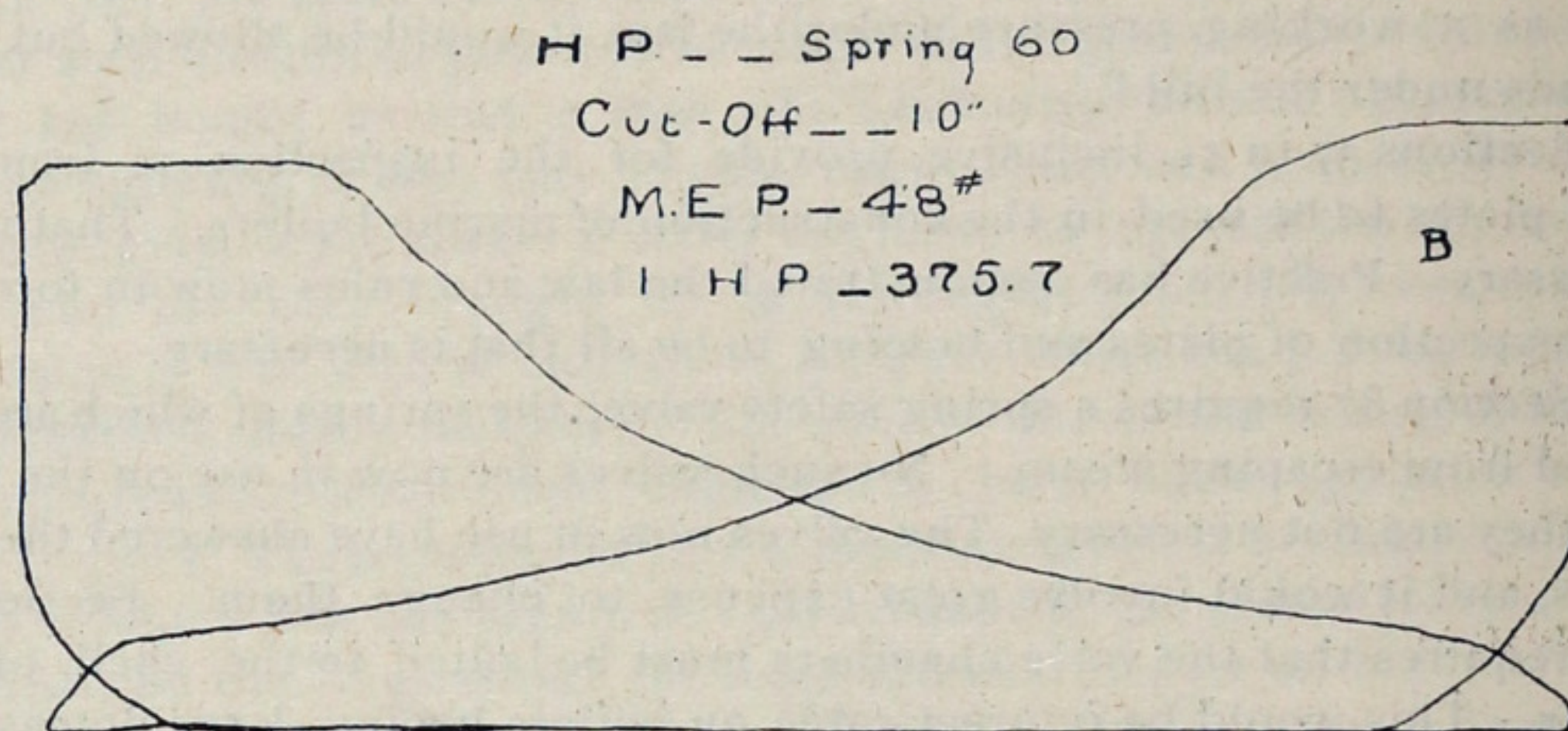
| | Chicago. | Duluth. |
|--------------------------------------|---------------|---------------|
| In store | 9,367,950 bu. | 8,585,797 bu. |
| Afloat | 817,339 bu. | 400,703 bu. |
| Increase last week..... | | 217,758 bu. |
| Decrease last week..... | 113,147 bu. | |
| Excess over same time last year..... | 2,667,527 bu. | 4,577,426 bu. |

Although there is a decrease at Chicago in stocks of wheat as compared with the previous week, corn shows an increase of 231,704 bushels. Stocks of corn at that point now aggregate 1,566,653 bushels, against 200,794 bushels on the same date in 1891. There is also 320,100 bushels of corn afloat in Chicago. Stocks of oats foot up 901,781 bushels, against 362,581 bushels on the same date in 1891.

Cards From the Panther's Engines.

[BUILT BY THE FRONTIER IRON WORKS, DETROIT, MICH.]

These engines are 24 and 46 by 42 inches. Steam shown by guage was 118 pounds, vacuum 24 inches; revolutions were 84, and the indicated horse power shown below is 757.1.



Publications of Interest to Vessel Owners.

Scribners magazine for March contains an interesting illustrated article on "The Water Route From Chicago to the Ocean" by Chas. C. Rogers, U. S. N. The article presents some valuable data regarding the present condition of the Welland and St. Lawrence canals.

In the March number of the Engineering Magazine, George Y. Wisner, member of the American Society of Civil Engineers, answers replies by Col. Wm. Ludlow and Col. King, corps of engineers, U. S. A., to an article entitled "Worthless Government Engineering," which was printed in the January number of the same publication with Mr. Wisner's signature. The article from Col. Ludlow appeared in the MARINE REVIEW of Jan. 14, 1892, and that of Col. King in the Engineering Magazine for February.

We are indebted to Congressman V. A. Taylor of Ohio for advance sheets of a report by Consul Metcalf of New Castle, England, on the "World's Shipbuilding." It is from a report published by the Chronicle newspaper of New Castle.

Horatio Seymour of Marquette, Mich., a few days ago addressed an open letter on lake commerce to Hon. Henry W. Bentley, representative in Congress from the Oneida district New York. It deals mainly with statistics of Lake Superior shipping.

The New York Times of Sunday, January 31, contains a very interesting article on ships of wood or metal. The writer of the article credits many of the facts which it contains to the "Manual of Naval Architecture" by Mr. W. H. White, chief constructor of the English navy.

Around the Lakes.

Capt. Harvey Shipman died at Manistique, last week. He was thirty-nine years of age.

Uganda is the name of the big wooden steamer building at the yard of F. W. Wheeler & Co., West Bay City, for James McBrier of Erie.

William Bell, Toledo shipcarpenter, is making extensive repairs to the topsides of the schooner F. C. Leighton. Capt. Benjamin Calhoun is overseeing the job.

Business men of Atlanta, Ga., offer the American Steel Barge Company a large tract of desirable land on the Savannah river as an inducement to establish a ship yard at that place.

It is reported that the Soo Pulp Company, which is erecting a plant at Niagara Falls, has bought of G. E. Lee the steamer St. Louis and consorts Potomac and Champion, and that the consideration was about \$40,000.

At West Bay City work on the Big Three at Davidsons' yard is well advanced. The Dry Dock Engine Works, Detroit, is building two of the engines and the third is ready for shipment from the works of S. F. Hodge & Co., also of Detroit.

Cleveland engineers, members of the E. M. B.A., have taken advantage of a university extension movement that has become quite popular in the city by securing the services of C. H. Benjamin, M. E., from Case School of Applied Science for a series of lectures.

Capt. Edward M. Marion, who was for a number of years in the employ of the Union Steamboat Company of Buffalo, will succeed Capt. Charles McCrea as government inspector of boilers at Buffalo. Capt. James Doyle has been appointed harbor master at Buffalo.

The Buffalo Courier says that Rogers, Brown & Co. have leased the steamer C. F. Curtis and consorts Holland, Fassett and Reed to carry their iron ore next season from Escanaba and Marquette to Tonawanda. Each vessel is to be paid a stated sum for the season.

Lumbermen of the Portage lake district, who were forbidden the use of the Portage lake canals for floating logs to Lake Superior, have petitioned the secretary of war to modify the order so as to permit them to get a half million dollars worth of pine already cut to market.

Following are the officers of the Toledo & Island Steamboat company, elected a few days ago: S. C. Reynolds, president; Calvin Cone, vice-president; M. I. Wilcox, treasurer; Noah Swayne, secretary; A. W. Colton, general manager. Mr. Colton will have charge of the operation of the steamer City of Toledo the coming season.

Complaint has been made frequently during the past two seasons of navigation regarding delay in getting the fog horn on the main-land at Pelee, Lake Erie, in operation in thick weather. The apparatus is not of the kind required at such an important point, and the Canadian department of marine has in view the establishment of a new steam horn.

At the yard of the Craig Ship Building Company, Toledo, work has commenced on a stern-wheel steamer of the Ohio and Mississippi river type, 146 feet long, 28 feet wide and 4½ feet deep. The boat is for the Valley City Transportation Company of Grand Rapids, Mich., and will be used in freight and passenger business on Grand River, between Grand Rapids and Grand Haven.

The John Doty Engine Company, Toronto, has begun the construction of a side-wheel passenger steamer for the St. Catharines, Grimsby & Toronto Navigation Company. She is to be of steel and iron, 180 feet long, 44 feet beam, engines to be 1,200 horse power, to have accommodation for 600 passengers, and will cost \$75,000. It is expected that she will be finished and in commission by the middle of June next.

Capt. Carlton Graves has sold his interest of one-eighth of the steamer Cormorant to Capt. F. S. Lawton of Erie, who will sail the boat. Capt. Lawton was with the Wolf & Davidson company of Milwaukee. Capt. P. Donahue retires from the Winslow employ on account of failing health. He is sixty-seven years of age. The sale of the interest in the Cormorant was made by Capt. C. E. Benham. The price is \$5,000.

Capt. John Edwards, who was in command of the steamer Pearl for several seasons in the passenger trade between Cleveland and Lake Erie islands, will again take charge of that boat,

which will run out of Buffalo next season. He has been in the freight steamer Niko, for the past two seasons, but lately purchased an interest in the rebuilt Pearl. Capt. Edwards is one of the best passenger boat masters on the lakes.

In another part of this issue advertisements will be found from Commander Heyerman, U. S. N., stationed at Detroit, calling for proposals for maintaining buoys marking the entrance to Saginaw river, for provisions for vessels and light-stations in the Eleventh light-house district and for fuel for the district. Col. Wm. Ludlow, light-house engineer, also of Detroit, asks for bids on the metal work of nine circular iron oil houses.

The steamer D. H. Rust has been purchased from the Inter-State Transit Company of Milwaukee by L. S. Sullivan, T. J. Southard, H. C. Thatcher and William Robinson of Toledo. The consideration is said to be \$40,000. The Rust will carry 1,200 tons. She was built in 1873, rebuilt in 1882 and extensively repaired in 1891, also receiving a new boiler at that time. She will probably tow the schooner C. C. Barnes part of the season.

The four light-ships are all plated up at Wheelers' West Bay City yard but the engines, which are being built by the ship-building company, are not in yet. It is expected that the large steel boat for Hollister and Hollenbeck will be completed about June 1. The wooden work at this yard is progressing very well. The McBrier steamer is two-thirds planked and more than half of the Fitzpatrick tow-barge is in frame. The keel and a few frames are up for the other wooden steamer.

Capt. John Quinn, the Detroit diver, said that he did not think the Pewabic had been found, when the copper laden wreck was mentioned to him. "It is not very difficult to find a wreck in the locality where Pelkey lost his life," said he. "I know of three wrecks around there, the Water Witch, W. R. Colburn and the Detroit, and any one not acquainted with the boats could easily be mistaken. But my chief reason for believing that the Pewabic has not been found, is that the boat is in deeper water than those treasure seekers claim they found."

Hawgood & Canfield, Cleveland vessel brokers, have sold the lumber schooner Little Jake to J. V. Lutts of Port Clinton, O., for \$5,000. The boat was owned by the Hawgood & Avery Transit Company. J. J. Ward, who recently purchased one of the old steamers of the Goodrich Transportation Company and has just paid \$100,000 to Comstock & Churchill of Alpena for the steamer Niko and consort Churchill, is a Chicago distiller. The boats have a combined carrying capacity of about 2,500 tons and their insurance valuation is \$112,000. G. G. Hadley of Toledo now owns two-thirds of the big wooden steamer bearing his name, having purchased G. H. Ketchum's interest, the price being reported at \$50,000. Capt. M. J. Galvin of Buffalo has bought three-fourths of the steamer J. H. Shrigly of Barber, Scully & Co. of Dunkirk. Her engine is being changed into a compound, 20 and 40 by 30 inches, and she is getting a new steel boiler.

Fifty-Second Congress—First Session.

The following bills of interest to lake vessel owners have been introduced in Congress recently:

H. R. 6,182, Cummings—To establish communication with light-ships and light-houses.

S. 1,222, Frye—To protect the wages of seamen.

S. 743, Frye—To establish a marine board for the advancement of the interests of the merchant marine. (Amended).

S. 744, Frye—To dispense with special inspectors of foreign vessels.

H. R. 6,539, Covert—To declare bridges constructed over navigable waters, under charters granted by the states and approved by the secretary of war, lawful structures and military and post roads.

S. 2,355, Frye—To amend the laws relating to shipping commissioners, seamen and owners of vessels, and for other purposes.

H. R. 6,292, Kilgore—To authorize the construction of bridges over navigable streams in the United States.

Brigadier-General Thomas L. Casey, chief of engineers, U. S. A., has been relieved from duty with the light-house board at his own request, and Col. Geo. S. Elliott of the engineer corps has been detailed to that duty in his stead.

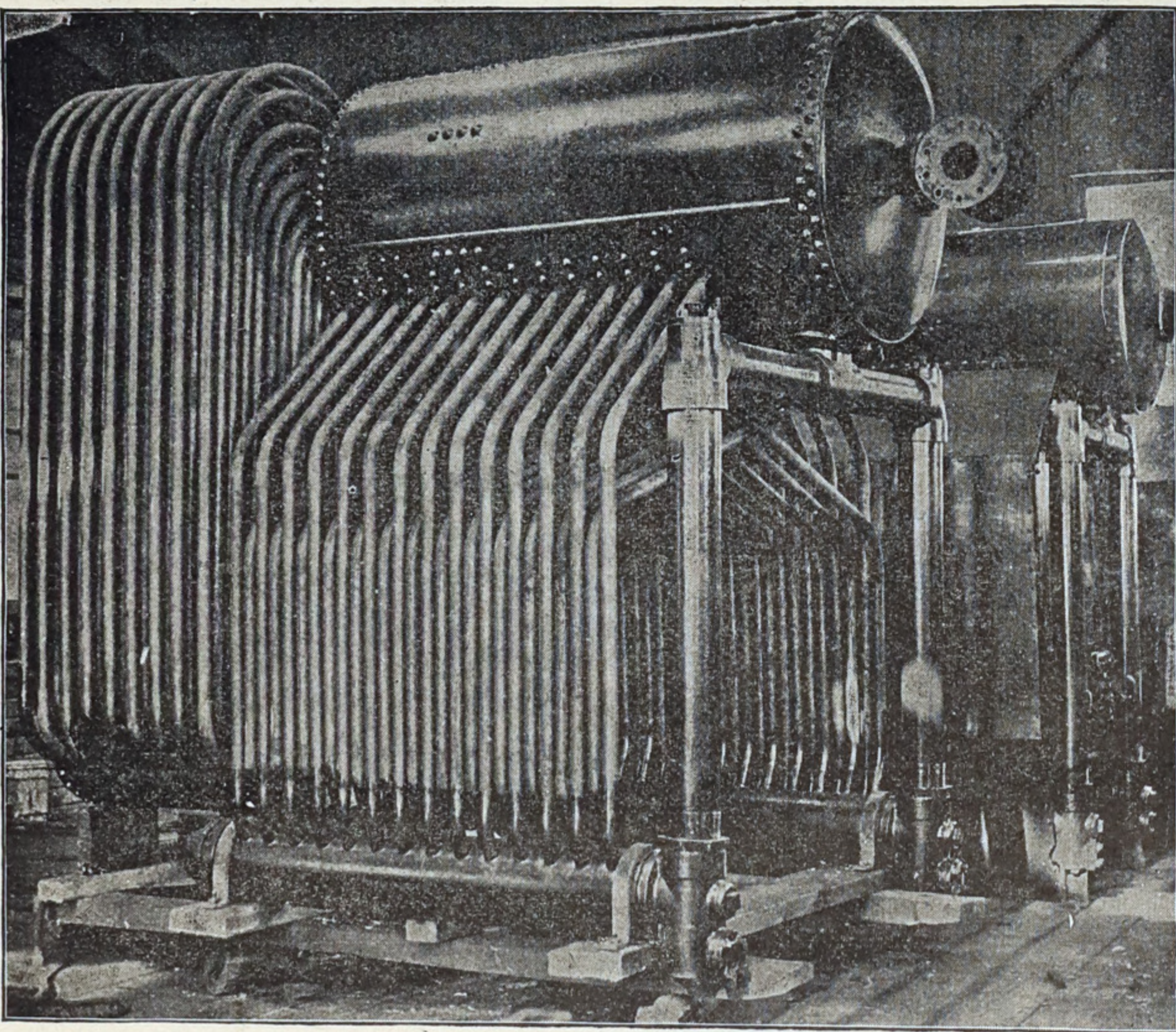
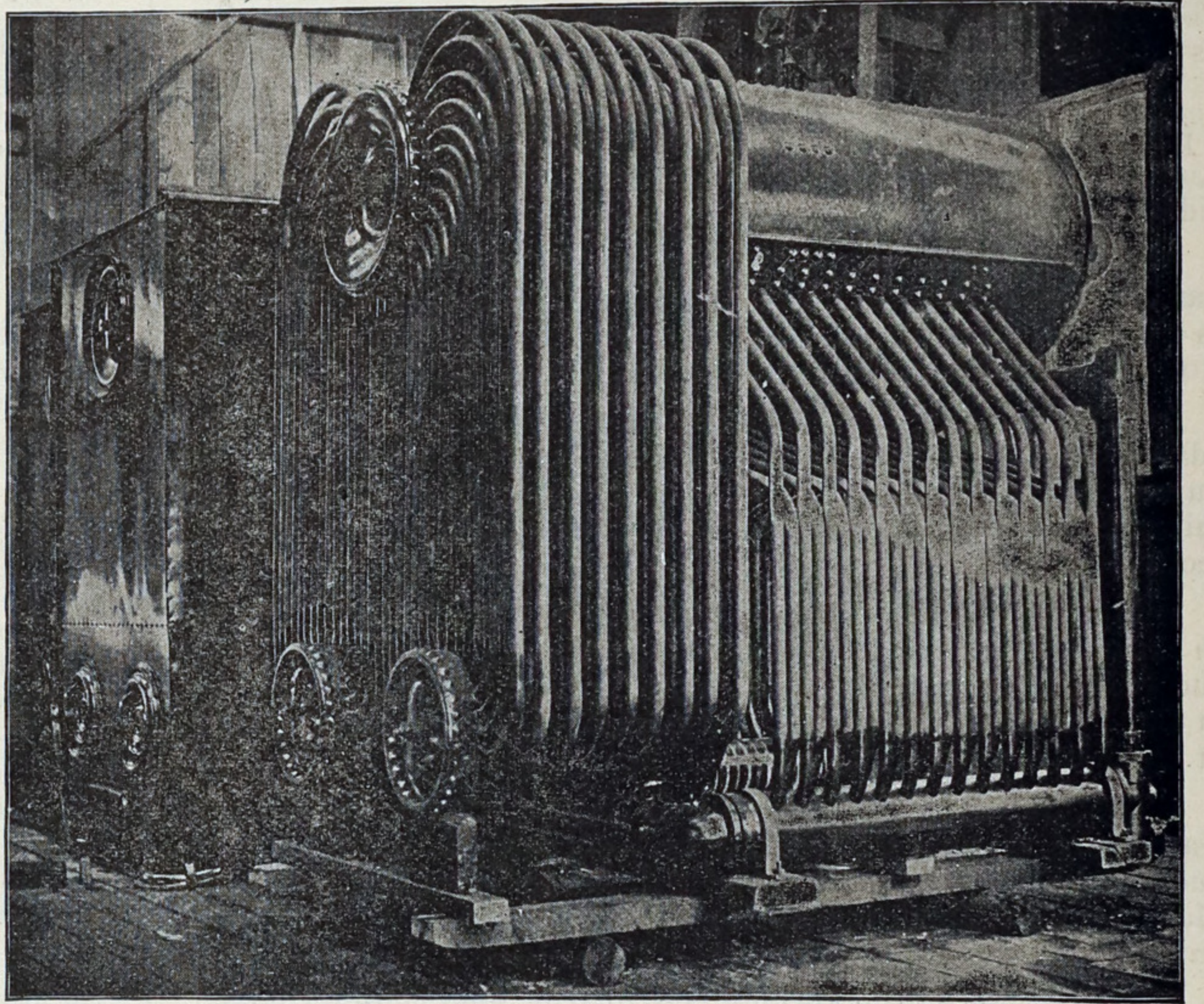
The Cowles Water Tube Boiler.

"The adaptation of water tube boilers for marine purposes, will surely come, and the inventor who overcomes the few difficulties in the way will make a long stride in fuel economy in marine engineering," said a gentleman who had charge of Cramp's boiler shop for a number of years. The efficiency of Cowles water tube boiler in the Baltimore fire-boat *Cataract* was mentioned in a recent issue, the steam maintaining the required 160 pounds pressure when all pumps and boat's engines were working. Two views of this boiler are shown in accompanying engravings. Two of these boilers with 1,400 square feet heating surface each will go into the fire boat for the city of Brooklyn, N. Y., for which the Cowles Engineering Company, South Brooklyn, N. Y., is building the engines and machinery as well as the boilers. This order with one from the American Steel Barge Company, West Superior, Wis., one for a fast New York yacht for two boilers and another for two boilers for heating and lighting purposes in a new Brooklyn building, was received last month.

The chief objection to water tube boilers has been that they overheat and do not expand equally. This has been overcome in the Cowles boiler and it is as safe with 200 pounds of steam as the ordinary boiler is with 100 pounds.

Both ashore and afloat the engine room is now far in advance of the fire-room. Excellent triple and quadruple engines are in regular commercial use calling for 160 to 200 pounds of steam and the efforts to furnish the steam for these machines with the old types of boiler are not satisfactory. The tendency now is to duplicate the modern steamship plant in the

gases passing around the tubes. The very important question of accessibility for cleaning, inspection and repairs has also been given thorough attention. For marine or portable work it is jacketed throughout with a steel shell casing lined with a non-conductor and fire tile supported by the tubes. The boilers are built in several sizes ranging from units of 500 horse power and 3 inch tubes, for large shore plants and steamship work, down to 25 horse power and 1 1/2 inch tubes for light work, such as



large electric lighting and traction stations of the country, and to do this it becomes more and more necessary, as the pressures increase, to use water tube boilers. The Cowles water tube boiler represents one of the latest successful attempts to meet this increasing demand for progress in the safe and economical generation of steam for high pressures. Special attention has been paid to strength and safety and to a perfect circulation, not only of the water and steam in the boiler, but of the

yachts. The tubes are of the best boiler tube manufacture, bent cold to easy curves in a special machine and expanded in; the shells are of the best mild steel, and the heads and manhole plates are of hydraulic-pressed steel. The heavy pipe and malleable fittings are so designed and arranged that they are in no part exposed to the fire or heated gases. The tubes can be thoroughly swept outside and cleaned by a flexible scraper or brush inside. Any tube can be plugged or entirely removed and replaced without injury to another tube, and access for this work can be had entirely through the uptake, furnace doors and manholes.

Bridges Over Navigable Streams.

On the 21st inst. a commission of army engineers, of which Gen. O. M. Poe is the senior member, will assemble in Detroit to consider an application made to the secretary of war to bridge the canal at the entrance to that port. Attention was called in a previous issue to the dangers of a bridge at this point, and it is absolutely necessary that the lake associations of vessel owners should be heard at this meeting. The clause in the last river and harbor bill which gives the secretary of war power to remove all obstructions over navigable streams and guard against their erection in the future was one of the best features of that measure. It is now being attacked on all hands by corporations and municipalities that are blind to the general good derived from protection to commerce on inland waterways. At least half a dozen bills attacking this law have been introduced in the present Congress. Duluth newspapers that speak of slow-going lower lake vessel owners in connection with the opposition to this scheme would do well to remember that Lake Superior towns that have grown up from the wilderness within a few years would never have been heard of if it were not for the wonderful advancement of lake commerce.

OFFICE OF U. S. LIGHT-HOUSE ENGINEER, Ninth and Eleventh Districts, Detroit, Mich., Feb. 29th, 1892. Proposals will be received at this office until 12 o'clock M., on Saturday, the 19th day of March, 1892, for furnishing all the material and labor necessary to construct the light-house and keepers' dwellings, at Old Mackinac Point, Straits of Mackinac, Michigan. Forms of proposals, plans and specifications, showing what is required, can be had or seen by applying to this office. The right is reserved to reject any or all bids, and to waive any defects. **WILLIAM LUDLOW,** Light-House Engineer. Mar. 3

OFFICE OF U. S. LIGHT-HOUSE ENGINEER, Ninth and Eleventh Districts, Detroit, Mich., Feb. 26, 1892. Sealed proposals will be received at this office until 12 o'clock M., on Thursday, the 17th day of March, 1892, for furnishing the material and labor necessary to completely construct and deliver at Light-House Depot, Detroit, Michigan, the metal work required for nine circular iron oil houses. Plans, specifications, forms of proposals and other information may be obtained on application to this office. The right is reserved to reject any or all bids and waive any defects. **WILLIAM LUDLOW,** Light-House Engineer. Mar. 3

OFFICE OF LIGHT-HOUSE INSPECTOR, 11th District, at Detroit, Mich., February 29th, 1892. Proposals will be received at this office until 12 o'clock M., on Tuesday, the 15th day of March, 1892, for maintaining all the Buoys now marking the entrance into Saginaw river, Michigan, and such others as may be authorized, for one year, from the first day of July next. Forms of proposals and printed specifications, showing what is required, can be had by applying to this office. The right is reserved to reject any or all bids, and to waive any defects. The contracts will not be approved until the Sundry Civil Bill making appropriations for the next fiscal year has become a law. **O. F. HEYERMAN,** Commander, U. S. N., Light-House Inspector. Mar. 10

OFFICE OF LIGHT-HOUSE INSPECTOR, 11th District, at Detroit, Mich., Feb. 29th, 1892. Proposals will be received at this office until 12 o'clock M., on Tuesday, the 15th day of March, 1892, for furnishing and delivering Provisions for Vessels and Light Stations in this district, for the fiscal year ending June 30th, 1893. Forms of proposals and printed instructions giving full particulars as to the articles required, and the terms of delivery and payment, can be obtained at this office. The right is reserved to reject the whole or part of any or all bids, and to waive any defects. The United States reserves the right to reduce the quantities specified, or to require the delivery at any time during the fiscal year of a greater quantity (not to exceed one-third) of any item or article mentioned in the specifications, and a clause to this effect will be inserted in the contract. Contracts will not be approved until the Sundry Civil Bill making appropriations for the next fiscal year has become a law. **O. F. HEYERMAN,** Commander, U. S. N., Light-House Inspector. Mar. 10

UNITED STATES ENGINEER OFFICE, 34 West Congress street, Detroit, Mich., Jan. 19, 1892. Sealed proposals, in triplicate, will be received at this office until 2 o'clock, p. m., March 4, 1892, and then opened: For furnishing Twelve Valve Frames and Fourteen Valves for the 800-foot Lock at St. Mary's Falls Canal, Michigan. Preference will be given to material of domestic production or manufacture, conditions of quality and price (import duties included) being equal. Attention is invited to Acts of Congress, approved Feb. 26, 1885, and Feb. 23, 1887, vol. 23, page 332, and vol. 24, page 414. Statutes at Large. The Government reserves the right to reject any or all proposals; also, to waive any informalities. For further information apply at this office. **O. M. POE,** Colonel, Corps of Engineers, Bvt. Brig. General, U. S. A.

SEND YOUR ORDER FOR "PATTERSON'S NAUTICAL DICTIONARY" (\$5) TO THE "MARINE REVIEW" AT ONCE.

OFFICE OF LIGHT-HOUSE INSPECTOR, 11th District, at Detroit, Mich., Feb. 29th, 1892. Proposals will be received at this office until 12 o'clock M., on Tuesday, the 15th day of March, 1892, for furnishing and delivering Fuel for Vessels and Stations in this District, for the fiscal year ending June 30, 1893. Forms of proposals and printed specifications, giving full particulars as to the kinds of fuel required, the quantity and quality, and the terms of delivery and payment, can be obtained at this office. The right is reserved to reject the whole or part of any or all bids, and to waive any defects. The United States also reserves the right to reduce the quantities specified, or to require the delivery at any time during the fiscal year of a greater quantity (not to exceed one-third) of any item or article mentioned in the specifications, and a clause to this effect will be inserted in the contract. Contracts will not be approved until the Sundry Civil Bill making appropriations for the next fiscal year has become a law. **O. F. HEYERMAN,** Commander, U. S. N., Light-House Inspector. Mar. 10

Graphite, (Plumbago or Blacklead.)

SEE CUT

Our Mines, Sonora, Mexico, produce the **PUREST GRAPHITE** in the WORLD.

OF A

WE DO NOT ADULTERATE OUR GOODS IN ANY FORM.

GENUINE

Try our **PAINT** for **Smoke Stacks** and **Boilers.** It will resist intense **HEAT** and **COLD.** **ACIDS** or **ALKALIS** don't affect it.

GREASER

Try our **ANTI-FRICTION GRAPHITED LUBRICANTS,** for all classes of machinery.

NEXT WEEK.

Try our **PIPE CEMENT** for **Caskets** and **Packing** Pipe and Valve Joints.

Try our **DRY GRAPHITE** for **Hot Boxes** and all **Bearings.**

Write for particulars and CATALOGUE.

UNITED STATES GRAPHITE CO.

931-939 No. Washington Av.

SAGINAW, E.S., MICH.

Steamer A. L. Hopkins, For Sale.

Carries 1,100 tons on 13½ feet of water. In A1 condition. Now lying at Buffalo. For price and particulars, write

A. W. COLTON, Gen'l Manager Lake Erie Transportation Co., TOLEDO, O.

MANUFACTURERS OF
COAL HANDLING MACHINERY.
INDUSTRIAL RAILWAYS
WORKS, STATEN ISLAND, N. Y.

C. W. HUNT, President. W. C. TURNER, Secretary.
Geo. S. HUMPHREY, Treas. C. C. KING, Chief Eng'r.
JOHN M. BLAKE, Auditor.

Address all communications to the Company and not to individual officers.

TELEPHONE "CORTLANDT 2071" CABLE ADDRESS "COALSHOVEL"
OFFICE OF
C. W. HUNT COMPANY,
45 BROADWAY.
NEW YORK. Feb. 17, 1892

Marine Review,

Cleveland, Ohio.

Dear Sir:-

Following the issue of your paper, in which you publish the extract from our catalogue No. 6, relating to "Knots, Hitches and Bends" we have to say that for a long time we were in daily receipt of a large number of letters asking for our catalogue, some days as many as twenty five or thirty queries being received.

Yours truly,

C. W. Hunt Company,

Per *Geo. L. Marvel*

A NEW COAL FIELD AND TIMBER DISTRICT

THE OHIO EXTENSION OF THE NORFOLK & WESTERN RAILROAD

Penetrates one of the most valuable Coal and Timber Districts in the United States. The line of this extension is 193 miles in length, from Coal Grove, Ohio, via Kenova, W. Va., to Elkhorn, W. Va., of which 54 miles, to Dunlow, W. Va., is now opened for business, and the entire line is under construction and will be completed early in the Fall of 1892. It passes through virgin country abounding in Gas, Splint, Cannel, Steam, Coking and Domestic Coals and Fire-Clay; Chestnut-Oak, White-Oak, Beech and Poplar Timber. Those looking for advantageous sites for the location of Saw-Mills or Tanneries, and establishments for the manufacture of Furniture, Wagons, Agricultural Implements, Wood-Pulp, Fire-Brick, or manufactured iron articles, should investigate the resources of this new field.

The new town of Kenova, W. Va., offers many advantages for the location of manufacturing establishments; also the territory opened up by the Norfolk & Western Railroad on the North bank of the Ohio River, between Kenova, W. Va., and Portsmouth, Ohio. For the manufacture of finished iron articles the district offers unequalled advantages, with supply of Coal and Pocahontas Coke on short hauls, and with the blast furnaces of the Iron-ton, Hanging Rock and Ashland district in close proximity. Favorable freight rates made upon raw materials to all manufacturing establishments on this line. For further information as to freight rates, maps, names of parties to whom application should be made for coal leases, etc., apply to

JOHN J. ARCHER, Div. Freight Agent, COLUMBUS, O., or CHAS. G. EDDY, Vice-President, ROANOKE, VA.

VESSEL AND MACHINERY EXCHANGE.

Space under this heading may be used gratis by our advertisers or subscribers to call attention to vessels or any craft, machinery, new or second hand, that they may have for sale. Those wanting machinery of any kind, or wishing to purchase vessels, are invited to take advantage of the same offer. Each item will be limited to three lines. Letters concerning same must mention number attached to item and be addressed MARINE REVIEW, 510 Perry-Payne Building, Cleveland, O.

107—FOR SALE—Harbor tugs, schooners, steam barges, passenger steamers and barges.

108—FOR SALE—Passenger steamer 125 feet long and rates A1.

109—FOR SALE—Screw excursion steamer 112½ feet over all, 20½ feet beam, 7½ feet deep with speed of 11 miles.

110—FOR SALE—Steamer Business, carries 1350 ore.

111—FOR SALE—20th interest in large steamer.

112—WANTED—To trade 40 acres of land for a vessel worth \$2,000.

113—FOR SALE—Steamer that will carry 1,100 tons on 13½ feet of water. Now at Buffalo.

114—WANTED—One 5x8 or 9 marine boiler, allowed 100 pounds steam, steel preferred.

115—WANTED—A 5x10 tug engine.

116—WANTED—A man who can figure construction cost, do buying and keep books for a foundry and machine shop that is making money.

117—WANTED—Steam Hoist capable of raising 2,500 pounds 150 feet per minute.

FOR SALE!—Passenger Steamer.

Length 125 feet, beam 25 feet, depth 9 feet, tonnage 346 gross; built in 1891. Rates A1 in good condition, economical on fuel and in every way desirable for parties desiring boat of this size. For price and further particulars, &c., address,

No. 108, MARINE REVIEW, Cleveland, O.

SHERIFFS MANUFACTURING COMPANY,

C. STARKE, Pres. W. H. MEYER, V. Pres.
THOS. W. SHERIFFS, Manager.

Manufacturers of

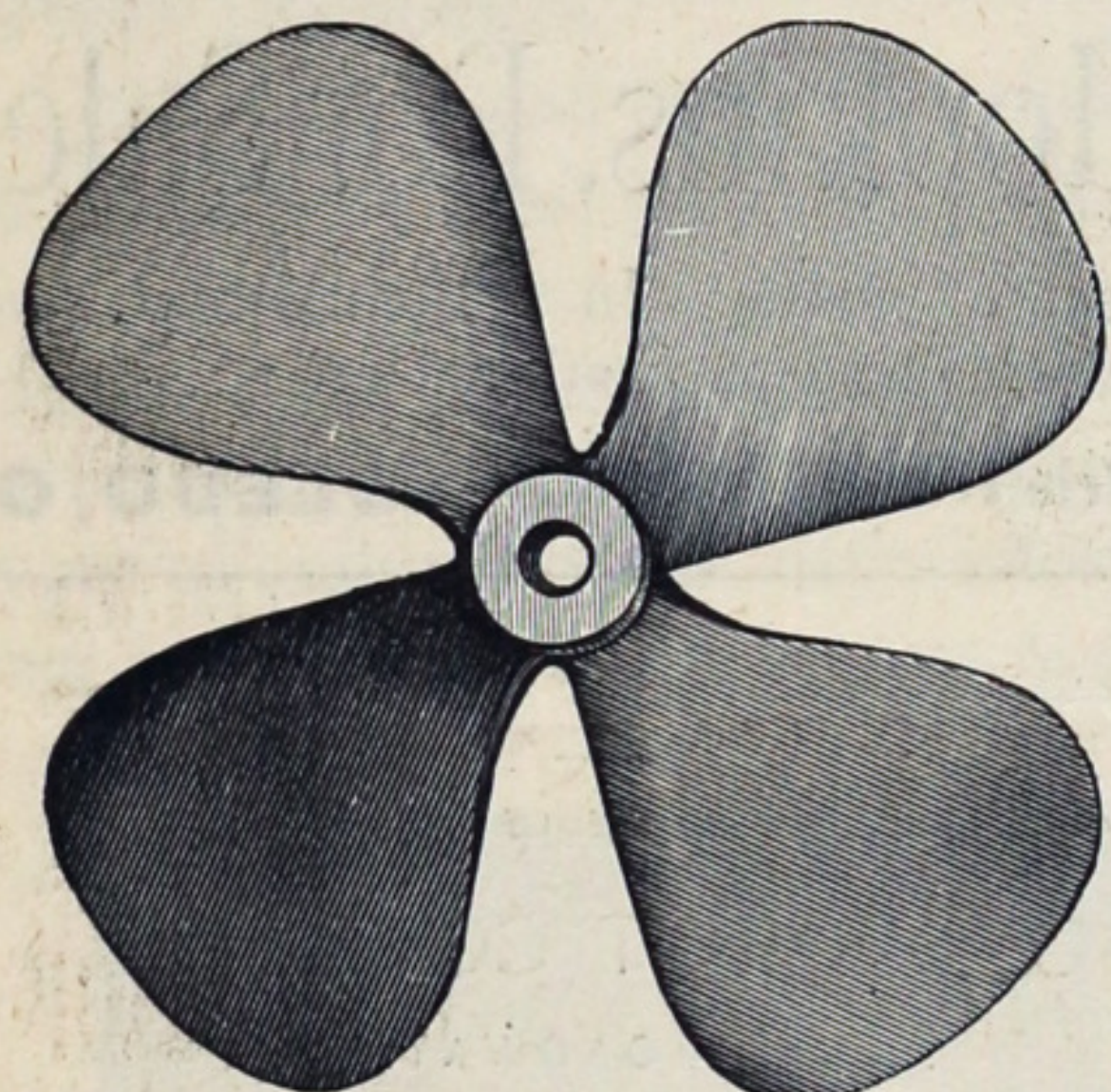
MARINE ENGINES,
PROPELLER WHEELS,

Dredge Machinery of Latest Design.

MARINE REPAIRS AT ALL HOURS.

124, 126, 128, 130 & 132 Barclay Street,
MILWAUKEE, WIS.

Telephone 163.



1867. PERFECT SATISFACTION GUARANTEED. 1892.

A. G. HARBAUGH & CO.,

34 & 36 River Street, CLEVELAND, O.

Manufacturers of Strictly Pure and
Acidless Lard Oils, specially adapted
for Steamboat use.

Will furnish Brand free for Ship Chandlers
or other dealers who desire their name
and address on packages.

H. G. TROUT,
KING IRON WORKS,

BUFFALO, N. Y.,

MANUFACTURERS OF
TRIPLE EXPANSION,
THREE CYLINDER,
FORE AND AFT

And STEEPLE COMPOUND
MARINE ENGINES,

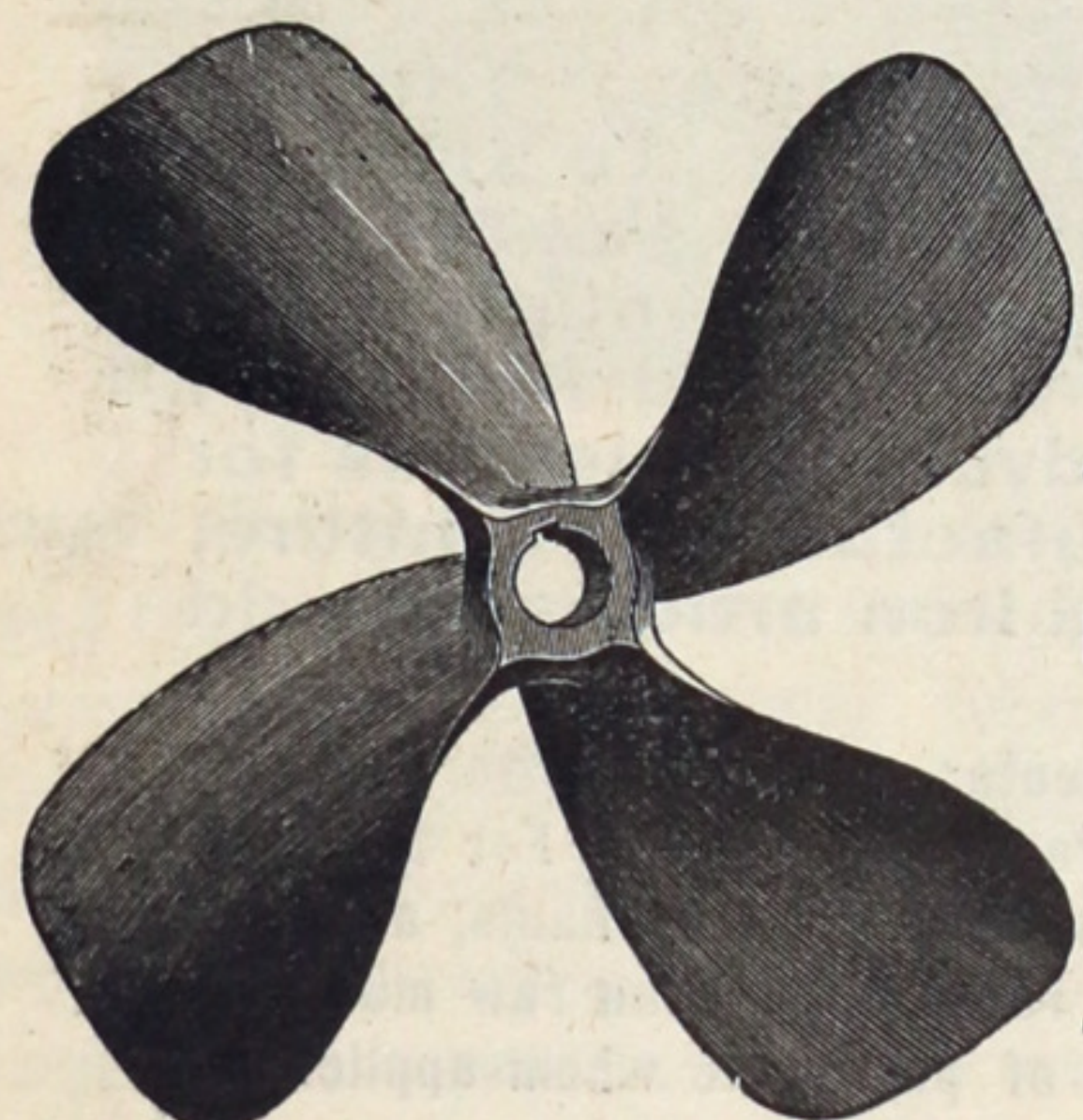
High and Low Pressure Engines,
Sectional, Propeller.

Tug and Yacht Wheels.

Cowles Aluminum and Manganese
Bronze Propeller Wheels.

These Wheels are noted for their extra
speed, towing power and propor-
tionate saving of coal.

PRICES QUOTED ON APPLICATION.



WANTED TO TRADE.

FORTY ACRES OF LAND, valued at \$2,300, for a
VESSEL worth \$2,000.

Address 112, MARINE REVIEW, CLEVELAND, O

FOR SALE.

HARBOR TUGS, SCHOONERS, STEAM BARGES,
PASSENGER STEAMERS AND LUMBER BARGES,
CHEAP.

Address: M. L. MARSH & CO., Sandusky, Ohio.

SCHOONERS for SALE.

The Schooner Wyandotte, rates A2, carries 450 M lumbe

Also, Schooner H. C. Sprague, carries 450 to 500 M lum er,

Both light draught.

Also, Schooner William Case, carries 350 M lumber.

Everything about these boats is in first-class condition.

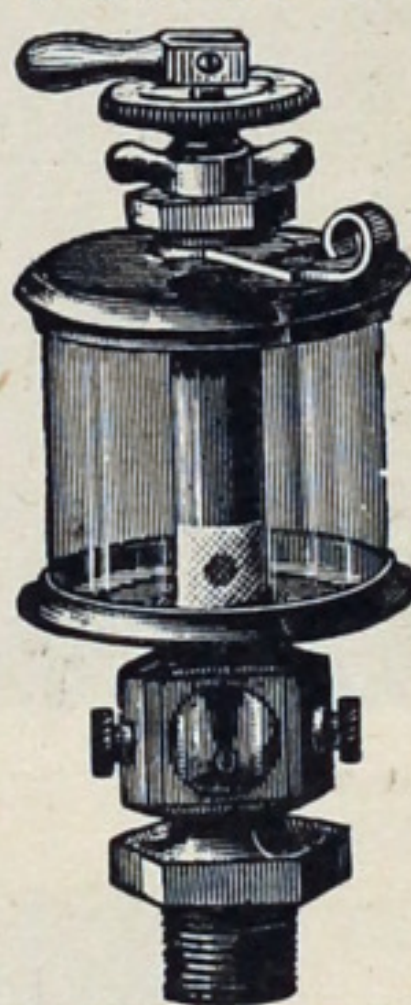
Address, BILLS & KOCH, Toledo, Ohio.

FOR SALE—FINE EXCURSION BOAT.

115 feet long, 26 feet beam, 7½ feet draft, compound engines;
will guarantee to run 200 miles with five (5) tons of coal; al-
lowed 500 passengers; WILL SELL CHEAP; EASY TERMS; owner
going out of business.

Address, No. 104, MARINE REVIEW, Cleveland, O.

Powell's Signal Oilers.



INCOMPARABLE FOR
ENGINES AND
DYNAMOS.

Convenient to fill.
Easy to regulate.

Flow of oil can be in-
stantly shut off by simply
moving the lever down—
without disturbing the ad-
justment.

Also made Double and
Triple Sight feed for
Marine Engines.

Your dealer can supply
you. Manufactured by

The Wm. Powell Co.,
CINCINNATI, O.

POPULAR and INSTRUCTIVE BOOKS

For Engineers and Firemen,

—BY—

STEPHEN ROPER, Engineer.

ROPER'S HAND BOOKS.

Hand-Book of Land and Marine
Engines.....\$3 50
Engineers' Handy Book..... 3 50
Hand-Book of Modern Steam Fire
Engines..... 3 50
Hand-Book of the Locomotive..... 2 50
Instructions and Suggestions for En-
gineers and Firemen..... 2 00
Use and Abuse of the Steam Boiler.. 2 00
Catechism of High Pressure Steam
Engines..... 2 00
Questions and Answers for Engin-
eers..... 3 00
Simple Process..... 50
Care and Management of the Steam
Boiler..... 2 00
Young Engineers' Own Book..... 3 00

These books embrace all branches of
Steam Engineering—Marine, Stationary,
Locomotive and Fire. Any engineer
who wishes to be well informed in all the
duties of his calling should provide him-
self with a full set. They are the only
books of the kind ever published in this
country, and they are so plain that any
engineer or fireman that can read, can
easily understand them.

Any of the above books will be sent to
any part of the United States or Canada
on receipt of list price.

Send money in Registered Letter, P. O.
Order or Postal Note.

EDWARD MEEKS, Publisher,

No. 1012 Walnut St., PHILADELPHIA, PA.

FOR YACHTS.

B. W. PAYNE & SONS, Elmira, N. Y.
45 Dey St., New York City.

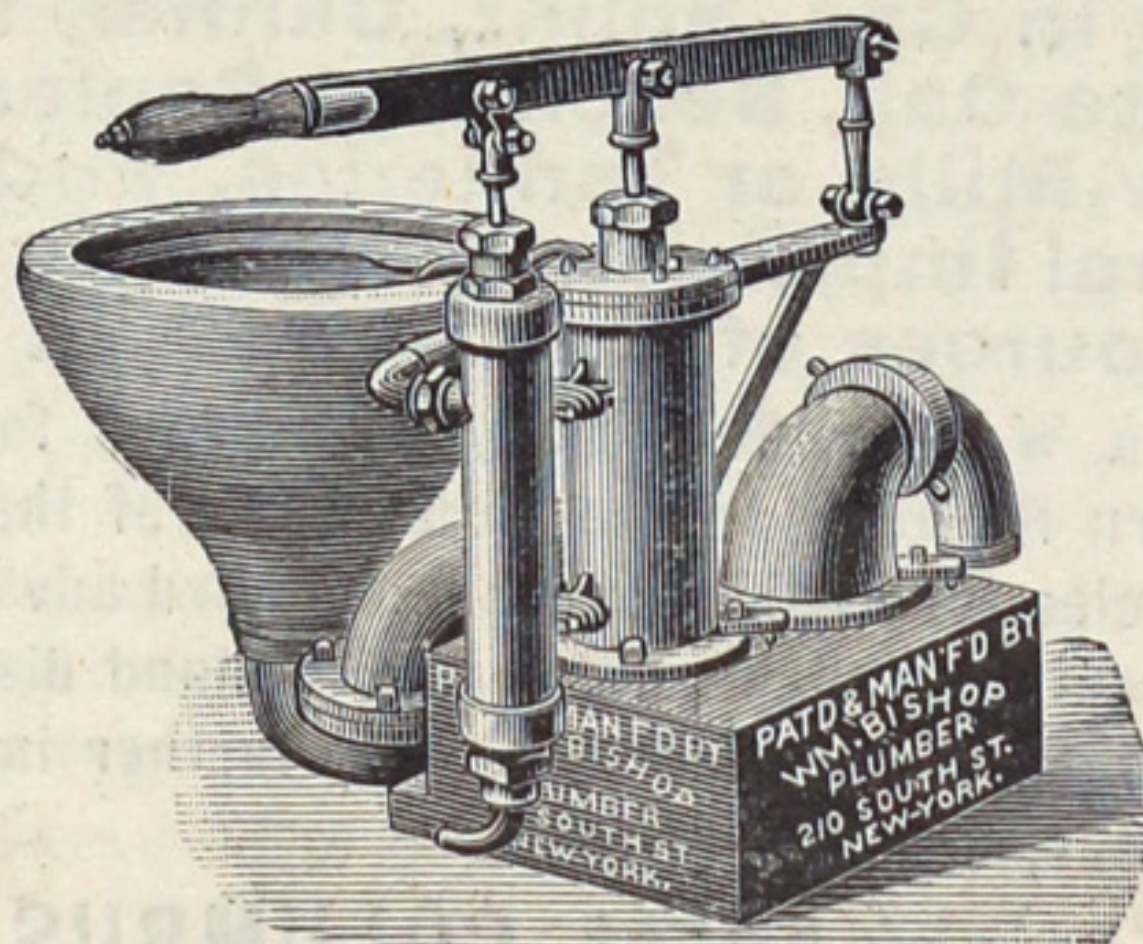
I. H. OWEN, PRESIDENT, F. H. VAN CLEVE, SEC. CAPT. GEO. BARTLEY, SUPT.
Chicago. Escanaba. Escanaba.

ESCANABA TOWING & WRECKING CO., Escanaba, Mich.

Tugs, Lighters, Steam Pumps, Hawsers, Hydraulic Jacks and Diving Appliances always ready.

TUG MONARCH, { Engine Compound, Cylinder 16 and 30 inches diameter, 30 inch.
Stroke, Steam Pressure Allowed, 125 pounds.
TUG DELTA, { Cylinder 20 by 22, Steam Pressure Allowed, 105 pounds.
TUG OWEN, { Cylinder 20 by 20, Steam Pressure Allowed, 104 pounds.

CENTRIFUGAL PUMPS, Seven and Fourteen Inch Suction.



Combination Pump and Water Closet

For above or below water line.

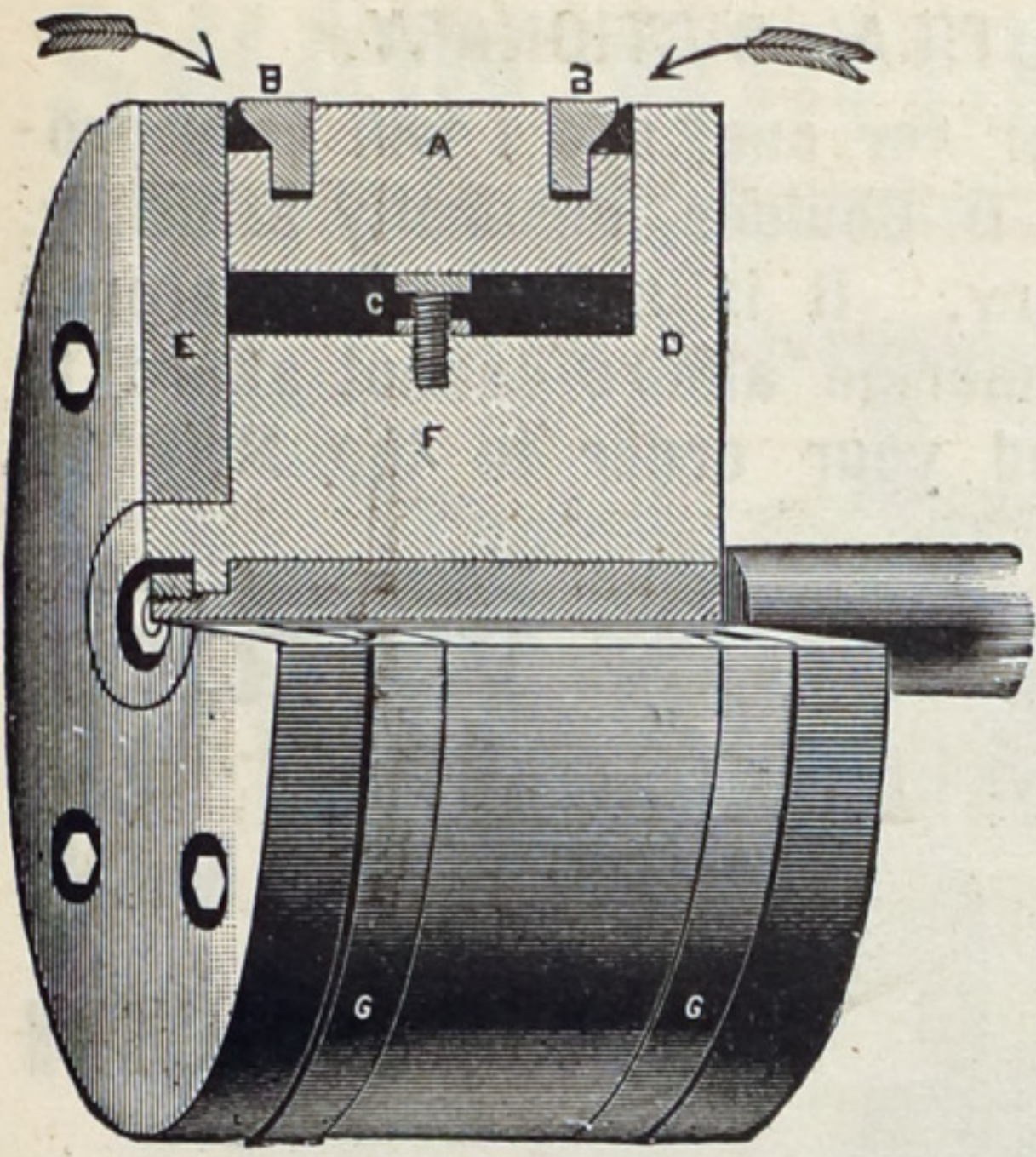
No valves or cocks to turn on or off.

WILLIAM BISHOP,
Plumber, Coppersmith and Steam Fitter,

210 South Street, NEW YORK.

Telephone Call, 4811 Cortlandt.

YACHT PLUMBING A SPECIALTY.



ST. JOHN CYLINDER PACKING CO.

Manufacture a PACKING specially adapted to all classes and sizes of

MARINE, LAND and LOCOMOTIVE ENGINES,

Air Compressors, Water, Oil and Ammonia Pumps.
Ensures Perfectly Tight Piston with Minimum Friction and is Self-Adjusting.
It Increases the Power of Engines **TEN PER CENT.** and saves
Fuel, Oil and Cost of Repairs.

IT WEARS THE CYLINDER ROUND AND TRUE AND RENDERS REBORING UNNECESSARY.

Highest and only awards International Exhibitions, Edinburgh and London, 1890. Special Medal of Superiority, American Institute, New York, 1888 and 1889; Massachusetts Charitable Mechanics Association, Boston, 1890.

SEND FOR DESCRIPTIVE CIRCULARS AND PRICE LIST.

D. DeKREMEN, Sales Agent, 280 Broadway, New York.

McBEAN, EDGE & CO.,

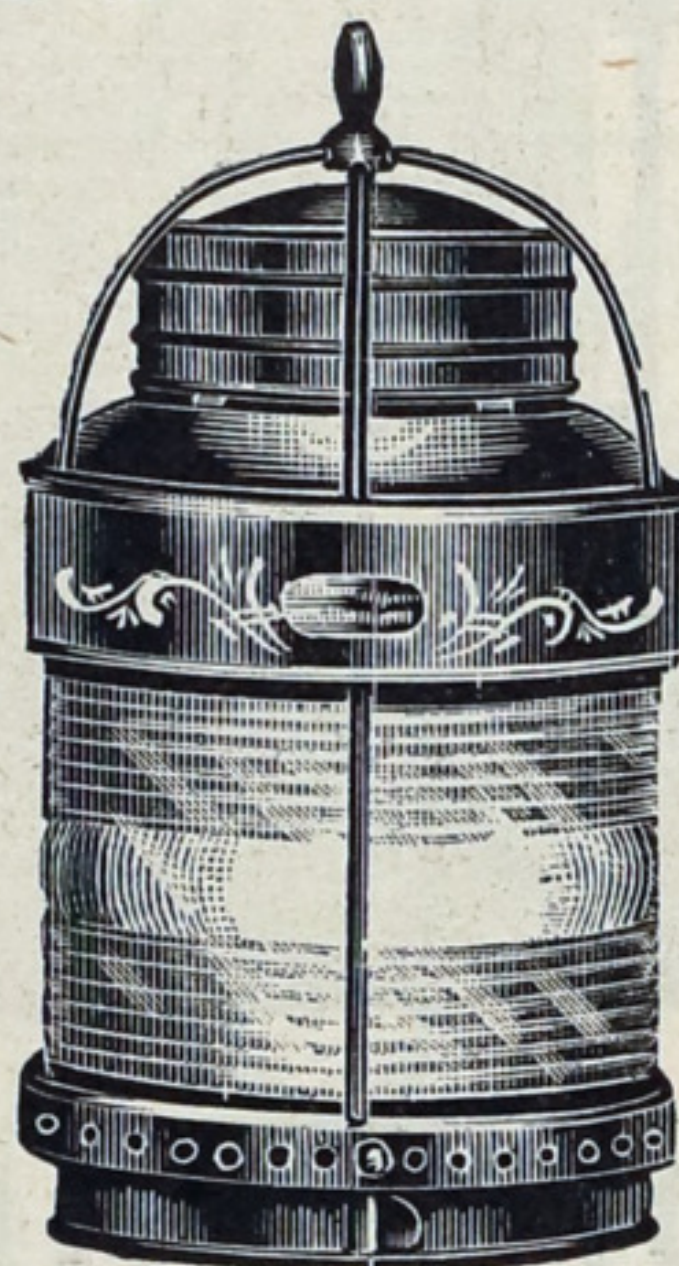
Steamboat Sheet Iron, Tin and Copper Workers,

— MANUFACTURERS OF —

S
I
G
N
A
L



L
A
M
P
S



With patent lenses, fluted or corrugated, with corrugations inside or out.

STEEL RANGES for Steamboats and Hotels.

HEAD LIGHTS, ENGINEERS' SUPPLIES,

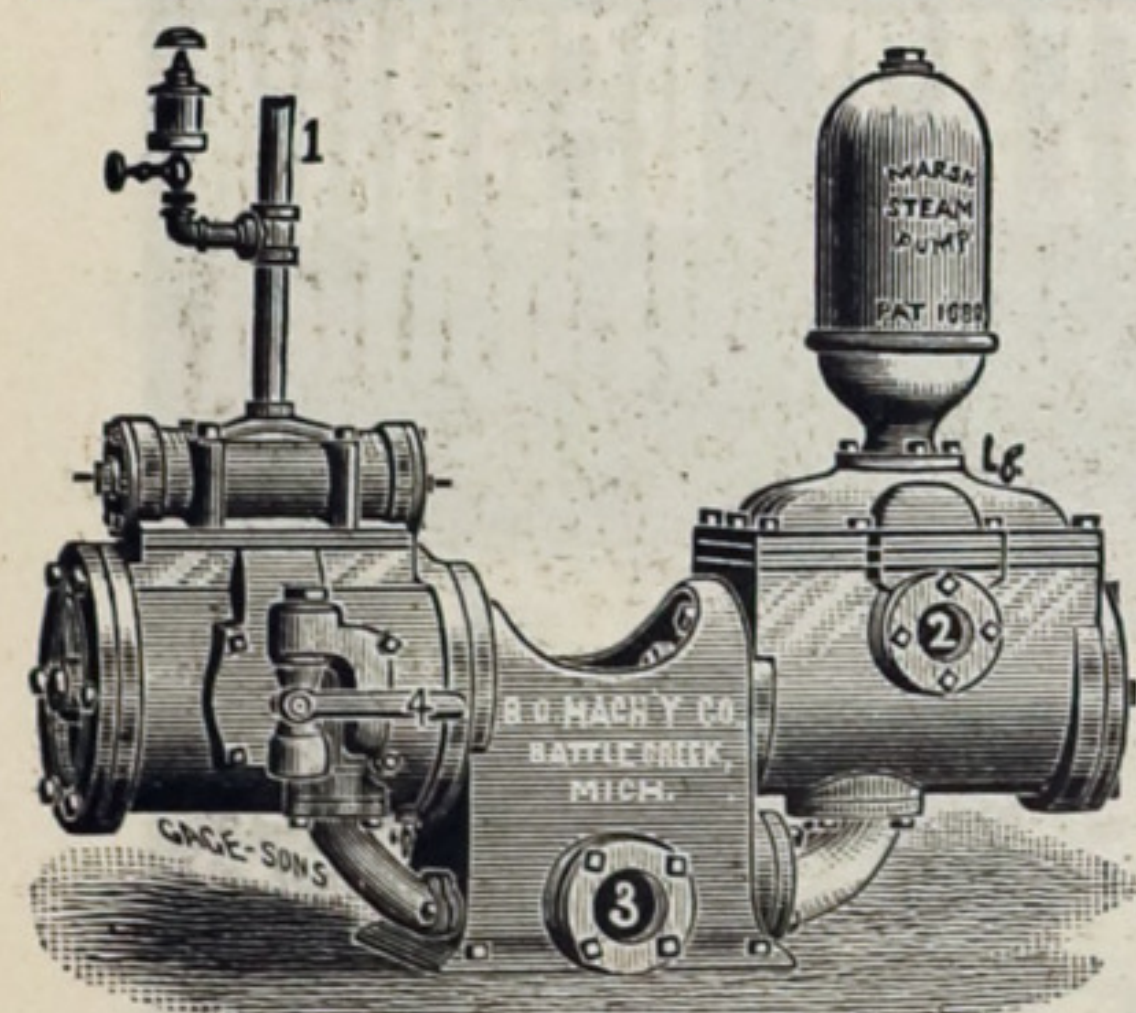
Anchor and Binnacle Lamps; Square, Triangle and Canalboat Head-Lights; Torches,
Coal Oil Lamps, Lanterns, Chimneys, Wicks, &c.

Telephone 803.

33 Main St., BUFFALO, N.Y.

SAMUEL WOODHOUSE,
(Successor to Ohio Chain Co.)
Manufacturer of Crane, Cable, Dredge and Crown Proof
COIL CHAINS, SAFETY CHAINS
AND COAL MINE CHAINS MADE TO ORDER.
Chains of Every Description Made to Fit any Wheel or Machine. First
Premium, Silver Medal, awarded at Northern Ohio Fairs
of 1870, 1872 and 1873.
OFFICE and WORKS, NEWBURGH, O.

The MARINE REVIEW and the MARINE ENGINEER, London,
one year for \$4. Write the MARINE REVIEW.



MARSH STEAM PUMP,

Absolute Actuation and Regulation Without Use of Tappets,
Levers or other Mechanical Connections.

FOR MARINE AND STATIONARY BOILERS.

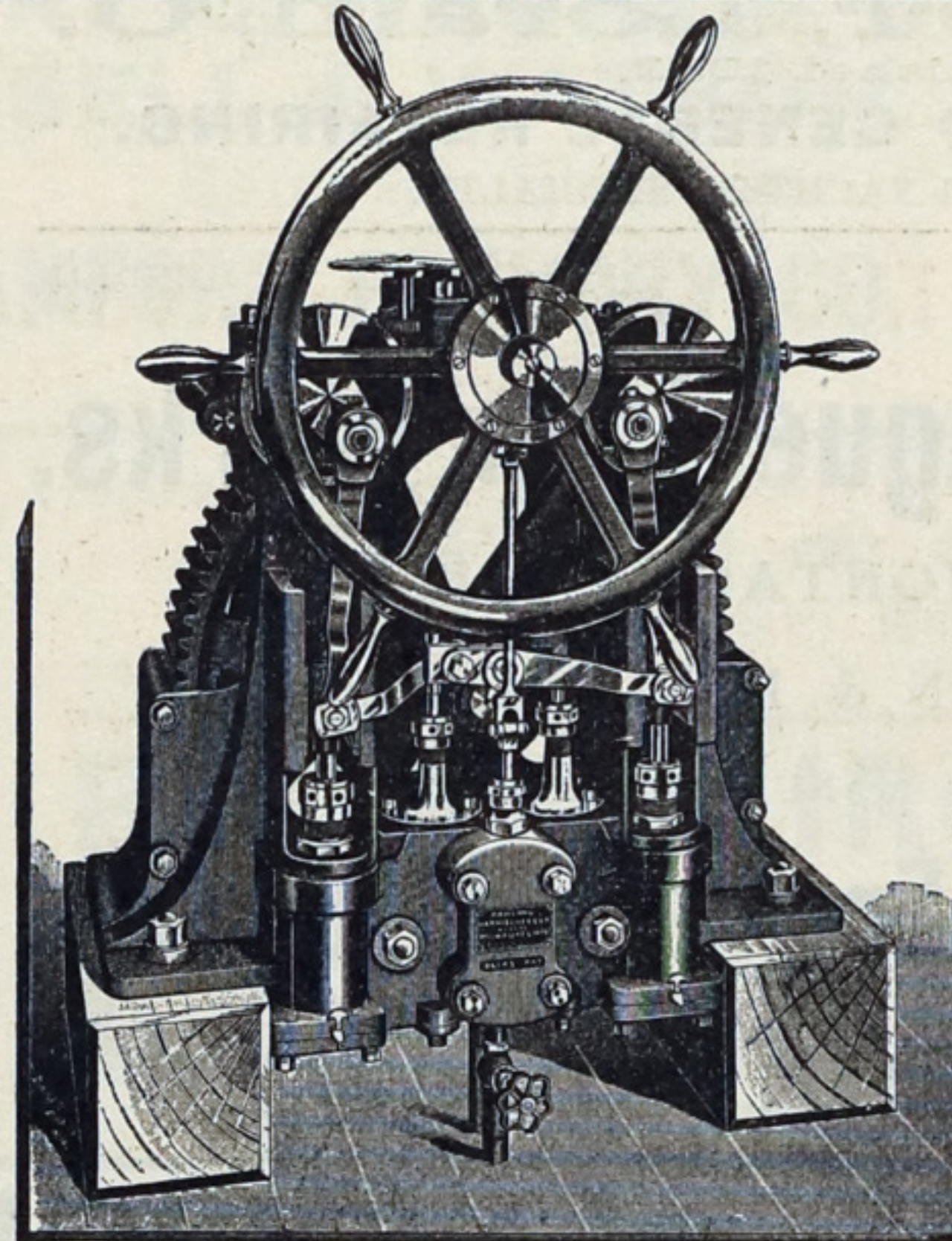
Smaller Sizes With or Without Hand Pumping Attachment.

Exhaust Returned to Boiler. Heats Feed Water Forty to Fifty Degrees, according to tests made by Prof. M. E. Cooley, of the University of Michigan.
Steam Valves Actuated by Direct Boiler Pressure.

Has Fewer Wearing Parts than ANY OTHER Steam Pump.

For Circulars and Prices, address

STRONG, CARLISLE & TURNEY, Cleveland, O. STANNARD & DILLON, Chicago, Ill.
DETROIT SHEET METAL & BRASS WORKS, Detroit, Mich. H. P. TOBEY, Toledo, O.
SMALLEY BROS. & CO., Bay City, Mich. CARLETON & COLE, Port Huron, Mich.
or BATTLE CREEK MACHINERY CO., Manufacturers, Battle Creek, Mich.



No. 4 BECK Steam Steering Gear.

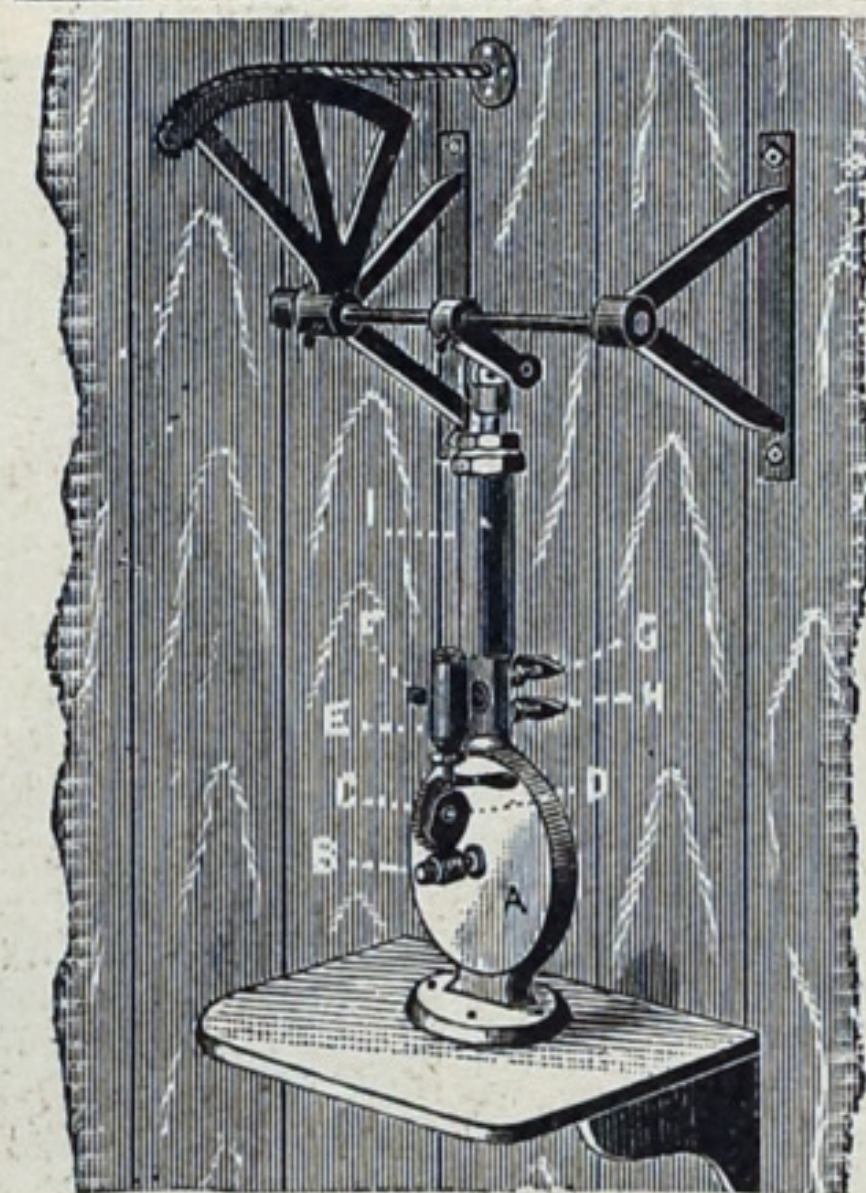
TUG PATTERN—Floor Space 18x36 In.

Changed from steam to hand gear instantly. Rudder moved hard-over, through one or more turns of wheel as desired. Is self-locking. Will cushion any blow on rudder and return to position automatically. All gears are machine cut. Position of Rudder shown by Indicator at all times.

PAWLING & HARNISCHFEGGER,
BUILDERS OF

Beck Duplex Feed Engines,
Steam Steering Gears and Hoisting Engines,
Electric, Steam and Hand Cranes,
Special Machinery and Tools.

156-168 Clinton St. Milwaukee, Wis.



RYMER'S Code and Fog Whistle Operator

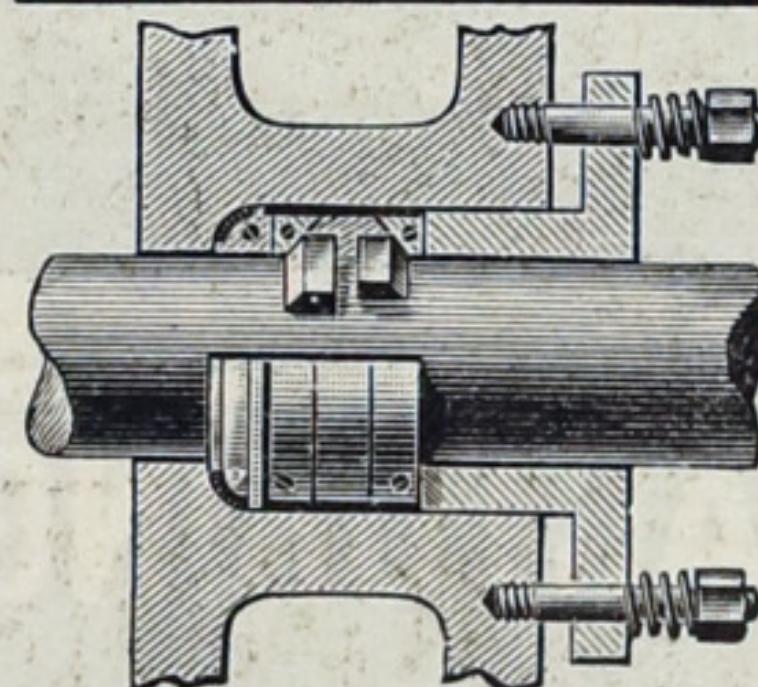
Can be placed on a bracket in pilot house.
Operation as a fog whistle does not interfere with its use as a code signal.

WM. RYMER,

Agent and Manufacturer,

395 Champlain St., DETROIT, MICH.

Correspondence Solicited.

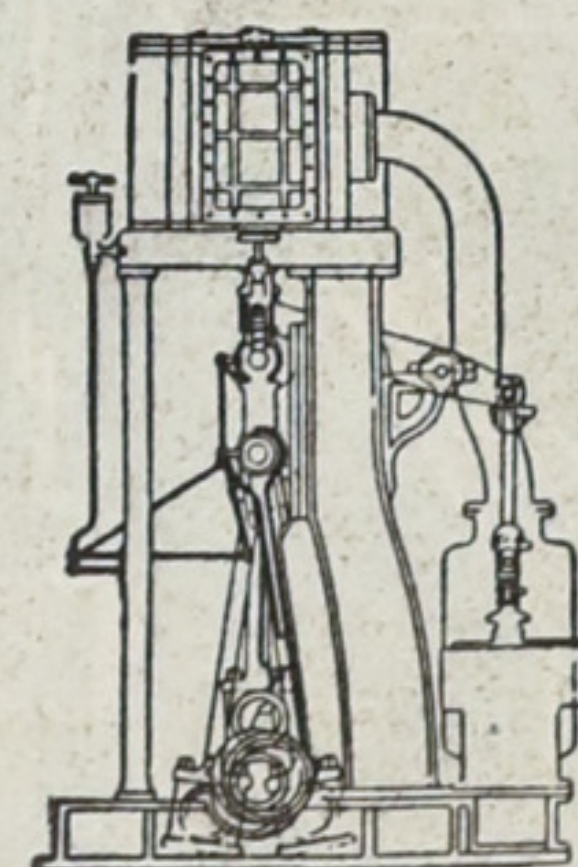


Forrest's Silver Bronze Packing.

Applied to any stuffing box, without disconnecting. Steam, air and water tight without the aid of soft packing, under the highest steam pressure and piston velocity, automatic, admits of excessive vibration, lashing and crowding of the rod, does not bind, economical, guaranteed to outlast all other packings. Used by the largest iron works, steamships and electric light companies for years all over the world. References. Agents wanted everywhere.

Address, 115 Liberty Street, New York City.

THE O'CONNELL GREASER,



During the past three years hundreds of marine engines of from 2,000 to 4,000 h. p. have been served, as well as high speed electric light engines.

RESULTS:

Sure control of Crank Pin.
Stoppage of Lard Oil account.
Perfectly clean Engine
O'Connell & Cahill,
Manistee, Mich.
Dark lines indicate apparatus.

Patterson's Nautical Dictionary, \$5.00. Order from the Marine Review, Cleveland, O.

CON. STARKE.

JOS. WOLTER.

AUG. RIEBOLDT.

RIEBOLDT, WOLTER & CO.,

SHIPBUILDERS,



SHEBOYGAN, WIS.

FLOATING DRY DOCK WILL LIFT VESSELS OF 400 TONS.

HAYES, HEINE & STACK,

MANUFACTURERS OF

MATTRESSES PILLOWS, AND BEDDING.

We make a specialty of fitting out vessels. Send for Prices.

70 EAST RIVER STREET, CLEVELAND, OHIO.

H. D. ROOT, Lorain, O.

Established 1853.

SHIPBUILDING AND GENERAL REPAIRING.

TUGS AND STEAM YACHTS A SPECIALTY.

J. D. WILSON.

M. HENDRIE.

Montague Iron Works,

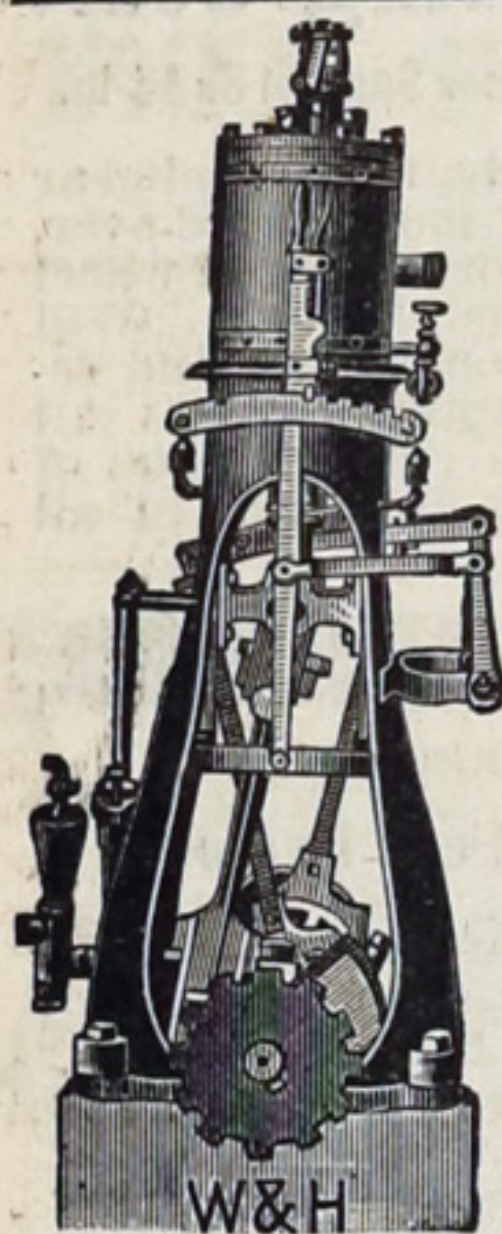
MONTAGUE, MICH.

WILSON & HENDRIE, Proprietors.

MANUFACTURERS OF

Marine Engines and Boilers,

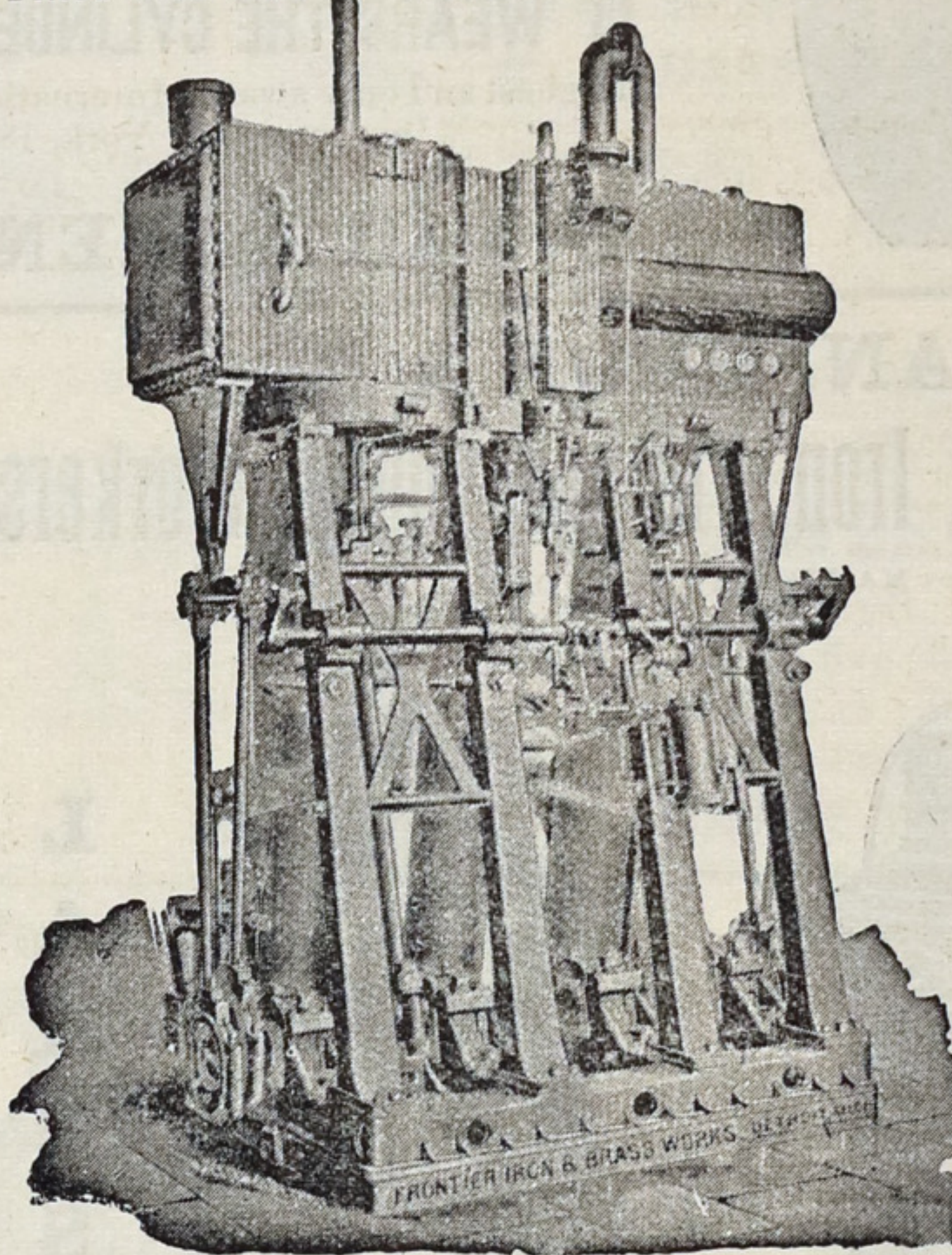
AND GENERAL MILL MACHINERY.

**PATTERSON'S NAUTICAL DICTIONARY.**

"You may take my order for one, and I will very probably want another," said H. D. Goulder, admiralty attorney, when he ordered the Dictionary. It is a book of reference that any one connected with marine affairs cannot afford to be without. Send \$5 00 and your order to the **MARINE REVIEW**, Cleveland, Ohio.

THE FRONTIER IRON WORKS,

Fitted with "JOY" PATENT VALVE GEAR.



DETROIT, MICH.,

Builders of

TRIPLE EXPANSION

and all kinds of

Marine Engines

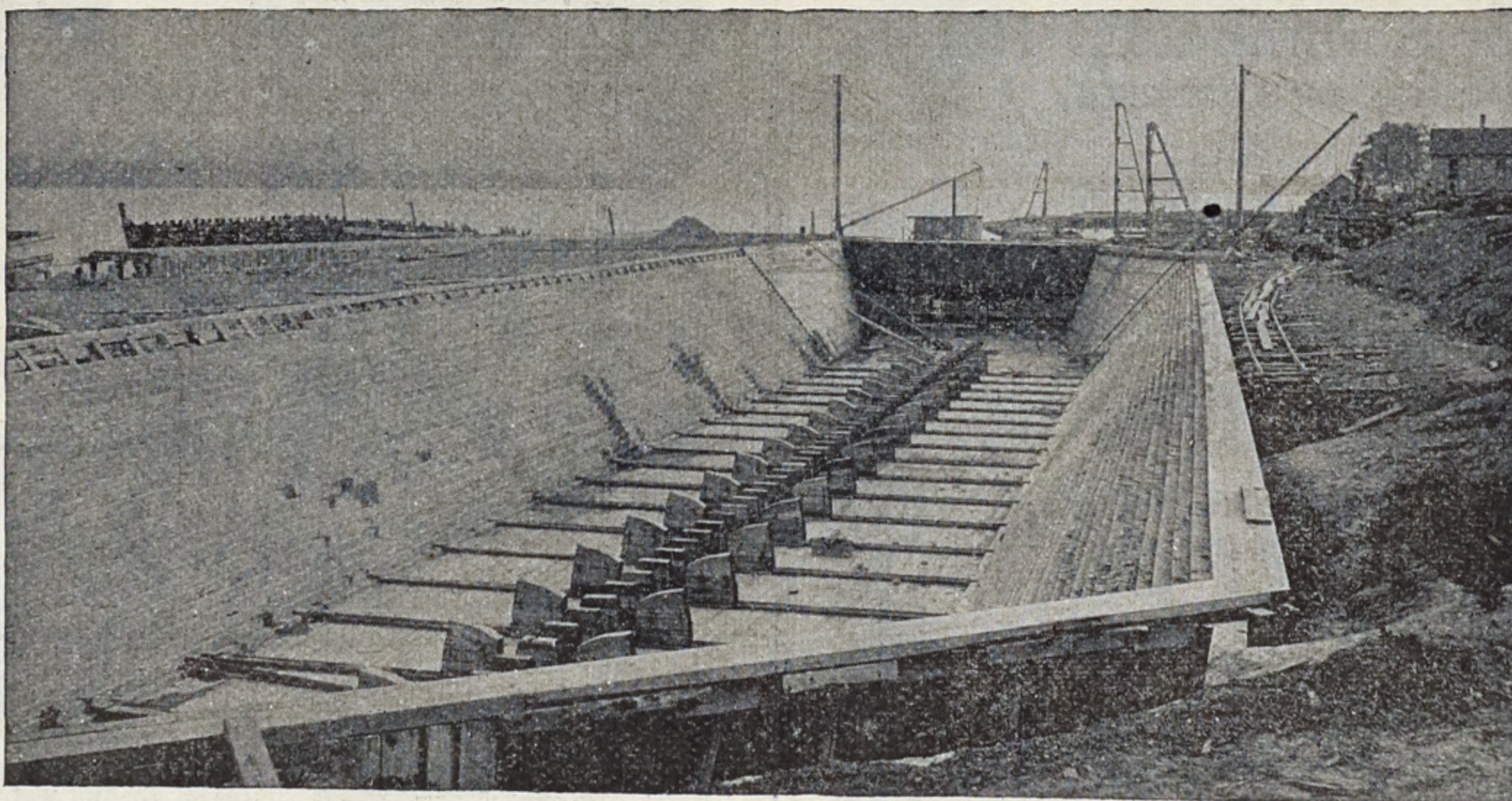
Engines furnished for Steamships:

T. W. Palmer,
Livingstone,
Majestic, Tampa,
John Mitchell,
Nyanza, Fedora,
Geo. F. Williams,
Mackinaw,
Keweenaw,
Jno. Harper,
W. F. Sauber,
and Iosco.
Panther, (fore and aft compound)

DUNFORD & ALVERSON, PORT HURON, MICH.**SHIP BUILDING.**

DOCKING,
REPAIRING,
SPAR MAKING.

DOCK HAS PIT TO SHIP RUDDERS.

**NEW DOCK.**

(Largest on the Lakes.)

Length: 400 feet.

Width: { on top 95 feet.
bottom 55 "
at gate 62 "

Depth: { to floor 20 feet.
to sill 18 "
on blocks 16 "

Nearest Modern Dock
to the SAULT or
MACKINAW.

McMYLER MANUFACTURING CO., 180 COLUMBUS STREET, CLEVELAND, O.

— SOLE MAKERS OF THE —

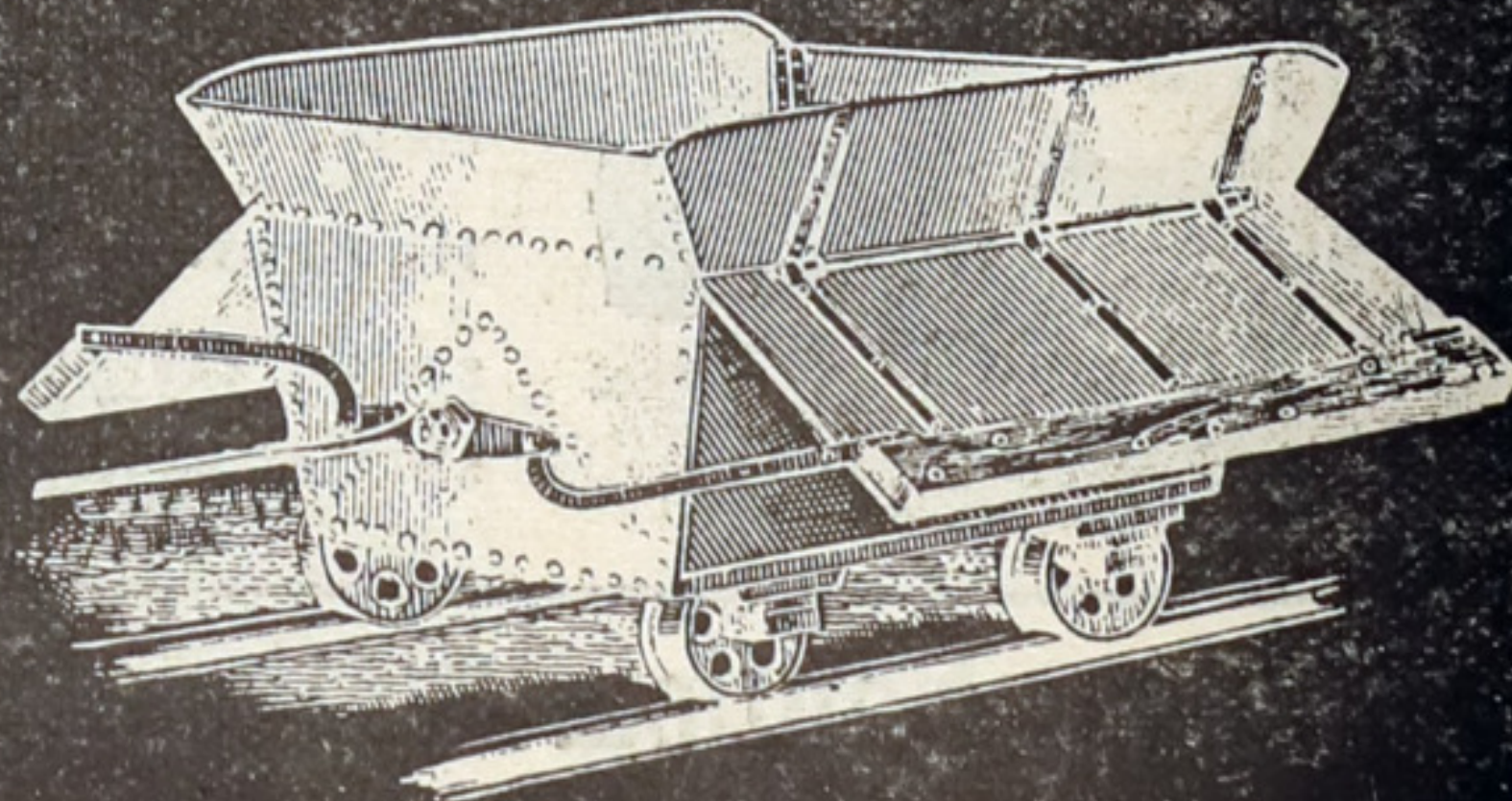
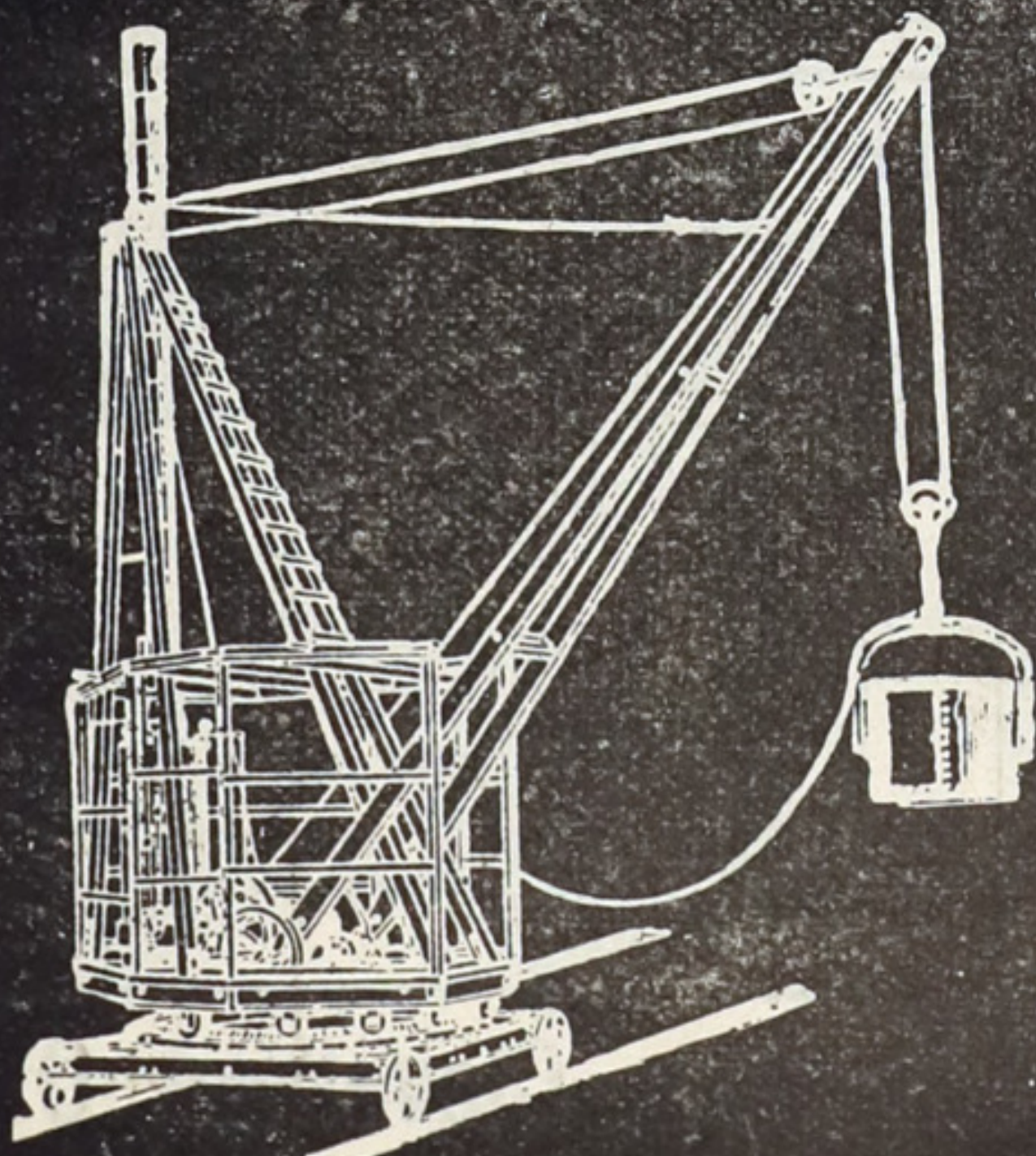
McMYLER PATENT REVOLVING STEAM DERRICK

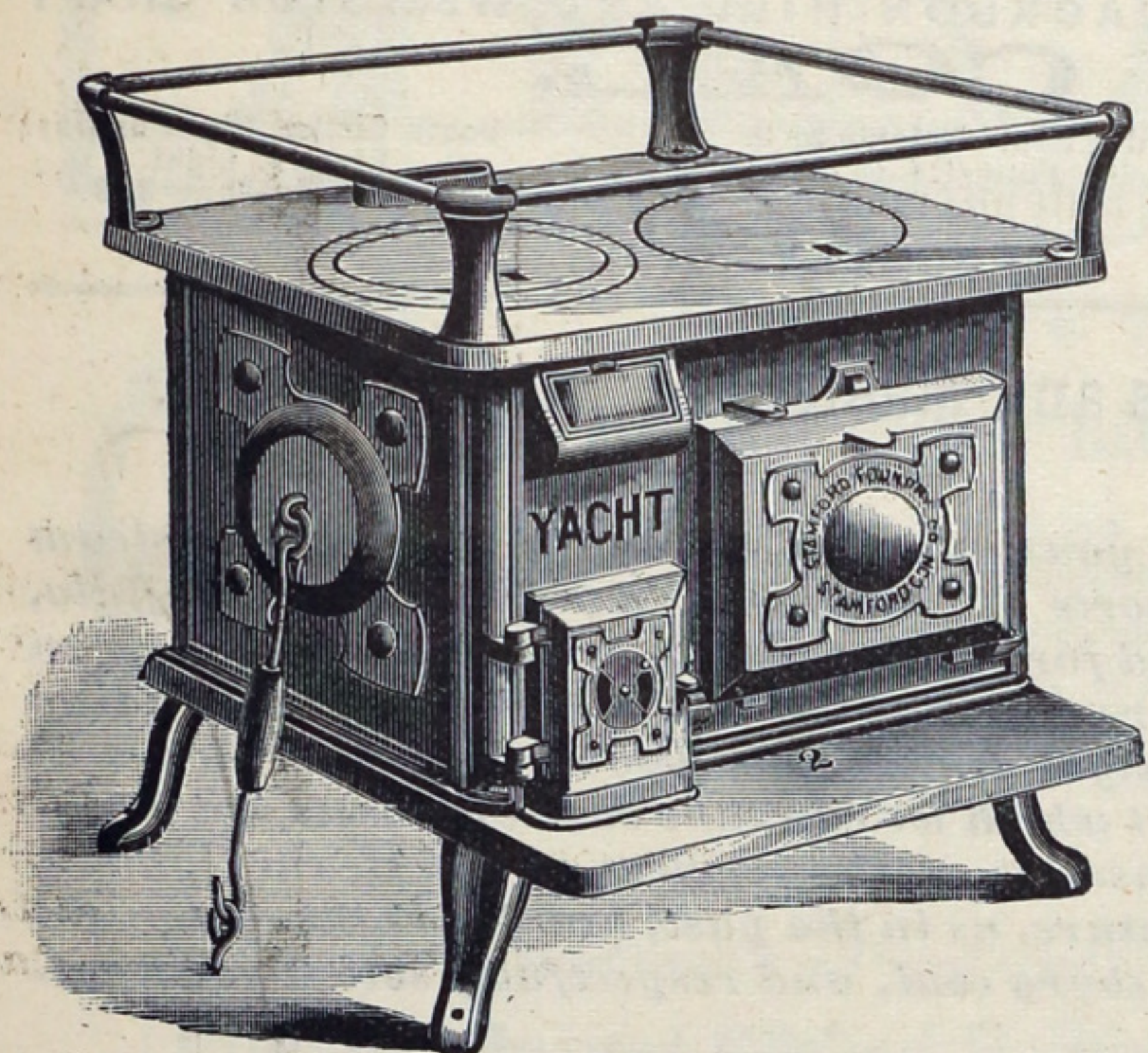
FOR HANDLING COAL, ORE AND COARSE FREIGHT OF ANY DESCRIPTION.

This Derrick can Lift Load, Alter the Radius of Boom, Swing in Either Direction at Will of Operator, and can Propel Itself on Track any Desired Distance.

BUILT FOR ANY CAPACITY WANTED

BUILDERS OF
CONVEYORS, COAL BUCKETS, ORE
BUCKETS AND DUMP CARS.



SWAIN WRECKING CO.TUGS FAVORITE
and SAGINAW.TELEGRAPH.
PARKER & MILLEN, DETROIT, MICH.
Capt. M. SWAIN, CHEBOYGAN, MICH.No. 2 IS THE SMALLEST OF THREE SIZES OF
THE YACHT.

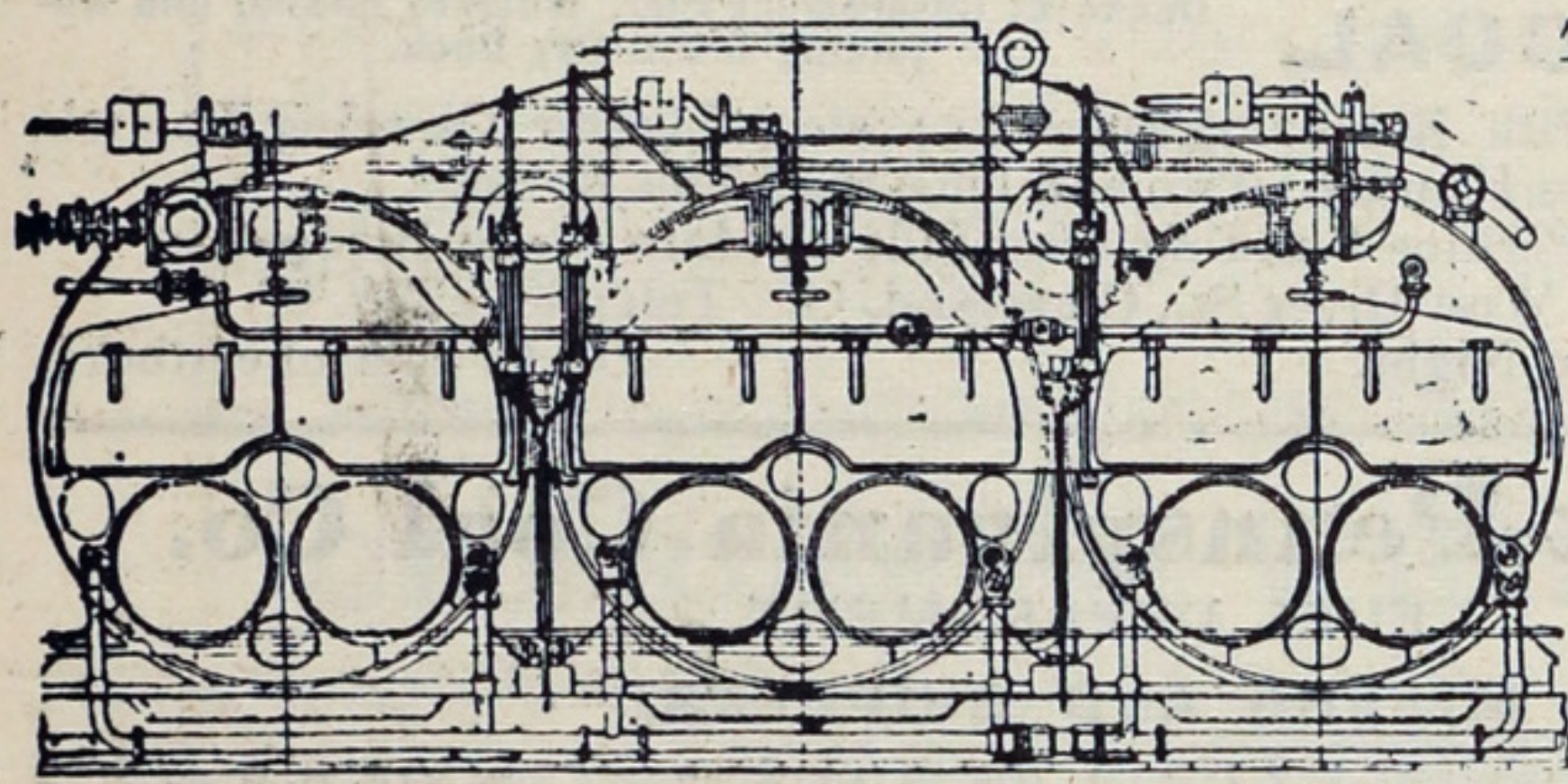
These Ranges are of the same character as the SHIP-MATE, the difference being in the size.

For Sale by

JENNISON & SON, Bay City, Mich.
HENRY C. WEBER & CO., Detroit, Mich.
RUSSELL & WATSON, Buffalo, N.Y.

Send for Illustrated Circulars.

THE STAMFORD FOUNDRY CO., STAMFORD, CONN.

LAKE ERIE BOILER WORKS.*The Best Equipped plant in America for the manufacture of modern Marine Boilers.*—o—
BUFFALO, N. Y.**FARRAR & TREFTS,****Propeller, Yacht & Tug Wheels,**
MARINE AND STATIONARY
ENGINES AND BOILERS.

REPAIRING PROMPTLY ATTENDED TO.

54 to 66 Perry Street,
BUFFALO, N. Y.

Drilling Boilers and Engines a Specialty

JOHNSTON BROTHERS,**Ferrysburg Steam Boiler Works,**
FERRYSBURG, MICH.**Marine, Locomotive and Stationary Boilers,**
Tanks and Sheet Iron Work.

REPAIRS PROMPTLY ATTENDED TO.

HENRY BLOECKER & COMP'Y,

—MANUFACTURERS OF—

ALL CLASSES OF **Marine Engines.**

General Job and Repair Work promptly attended to.

GRAND HAVEN, - - MICH.

C. H. McCUTCHEON,

(Successor to SAMUEL McCUTCHEON.)

Copper, Tin and Sheet Iron Manufactory,
Steamboat and Engineers' Supplies.

All kinds of Brass Cocks, Globe Valves and Couplings, &c. Iron Pipe and Fittings, and Mill Supplies. Rubber Belting, Hose and Packings, Springs, Valves, &c., Leather Belting and Usdurian Packing.

Telephone No. 68.

No. 18 Ohio Street BUFFALO, N. Y.

ERIE RUBBER CO.,

ERIE, PA.,

—MANUFACTURERS OF THE—

KEYSTONE MARINE VALVE.*These RED, AIR AND FOOT VALVES, are the Best Rubber Valves made.*

CAPT. R. T. LEWIS.

S. V. GILBERT

LEWIS & GILBERT,Telephone 140.
36 and 37 Exchange Building,VESSEL AGENTS & MARINE INSURANCE.
DULUTH, MINN.**PHOENIX IRON WORKS**

—MANUFACTURERS OF—

Modern Marine Engines AND Boilers

1223 to 1231 Fourth St., PORT HURON, MICH.

Telephone Nos. { Office, 15.
Residence, 192.

Special Attention Given to Repairs.

DULUTH DIRECTORY.**THE CLYDE IRON COMPANY,**

OFFICE AND WORKS: 302, 304, 306 & 308 Lake Avenue, South, DULUTH, MINN.

R. A. WEBSTER, Supt.

Machinists, Foundrymen, Blacksmiths and Steam Fitters. Special attention given Marine Work. Ship Chandlery & Mill Supplies, Packing s, Waste, Oils, Greases, Boiler Purgers, etc.

SEALINE LUBRICANT

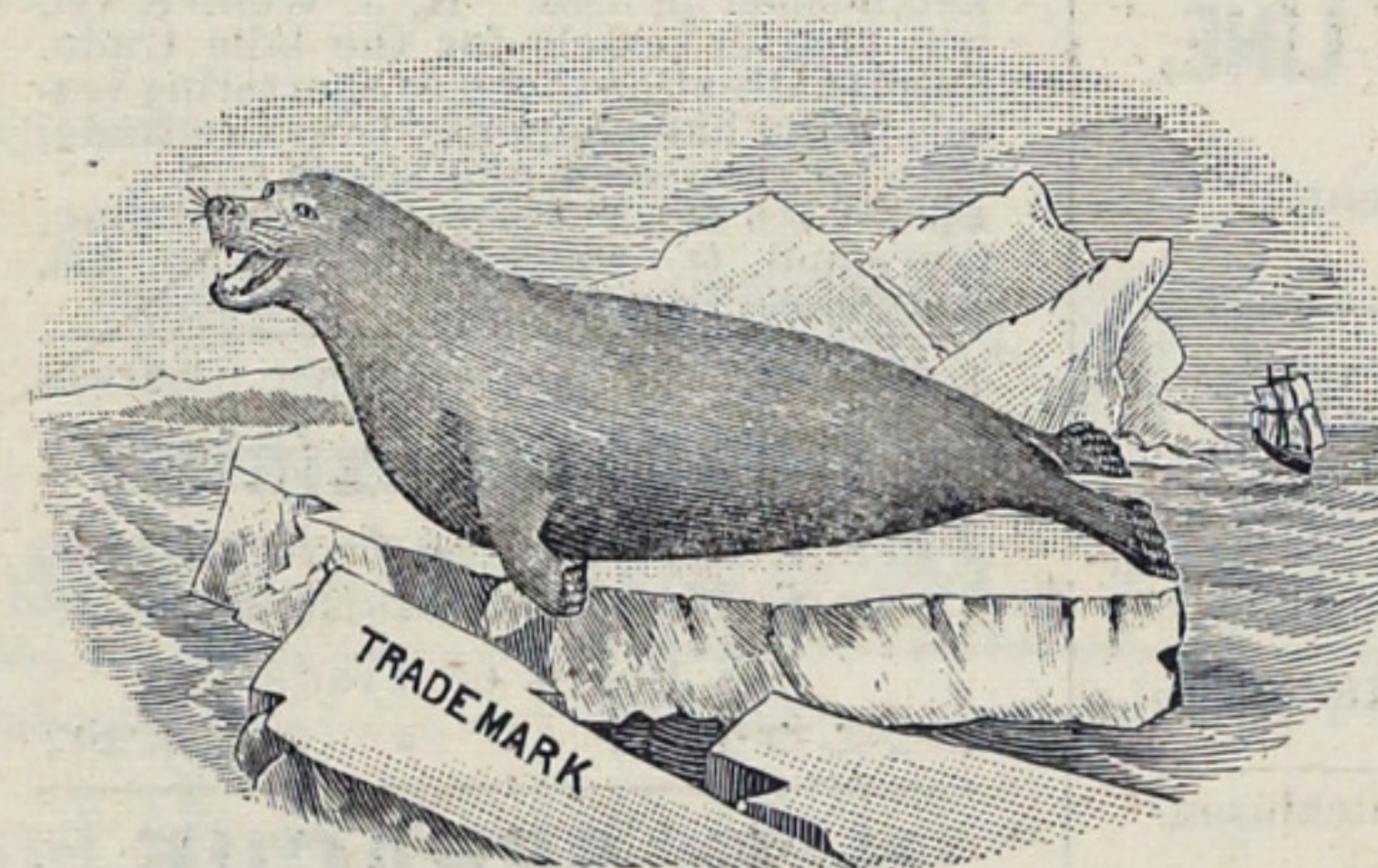
Specially adapted for

Marine Engines.

A Solidified Oil. Clean, and does away with Oils and Greases. Higher fire test. Acknowledged the most economical Lubricant made.

H. B. KINGSLEY & CO.,
CLEVELAND, O.288 SENECA STREET,
(new number)

Telephone 2126.

**JNO. L. JACKSON****Builder of DUPLEX HOISTING AND DECK ENGINES.**

Completely under control of throttle, reverse without link, stopped, started or reversed instantly, will hold load without brake.

These Engines can be arranged for Driving Rolls and many other purposes.

PLAIN, FINISHED and AUTOMATIC ENGINES,

From Heavy Patterns at Moderate Prices.

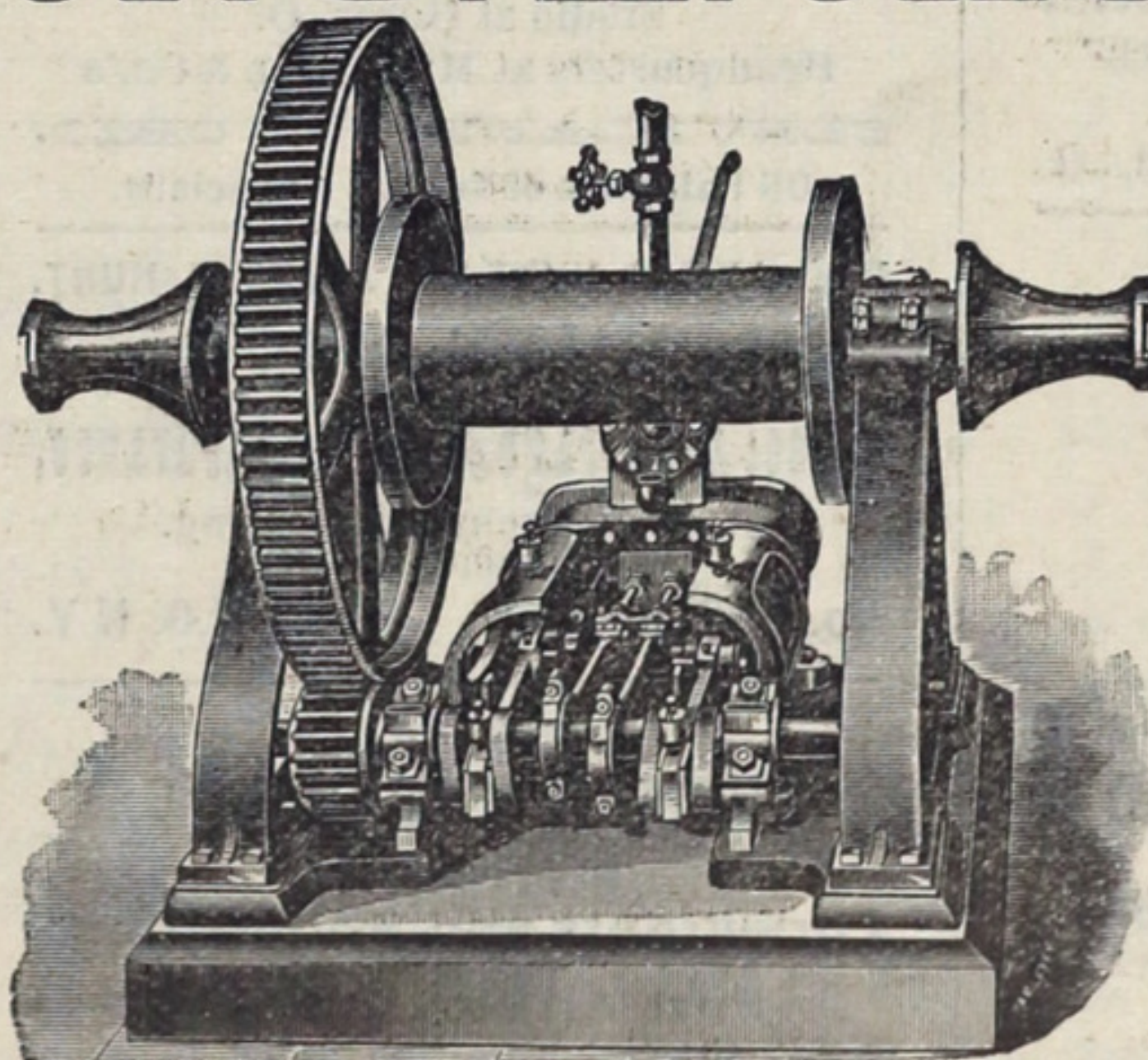
Vertical, Horizontal, Marine and Locomotive

BOILERS,

Strictly First-Class & Highest Test.

Saginaw, Mich.

Send for Circulars and Prices.



BROKERS & ADMIRALTY ATTORNEYS.

H. D. GOULDER. **GOULDER & PINNEY,** O. C. PINNEY.
LAWYERS AND PROCTORS IN ADMIRALTY,
CLEVELAND, O.

ROGER M. LEE. **LEE & TILDEN,** DUANE H. TILDEN.
Proctors in Admiralty.
Telephone 1191. 304 Perry-Payne Bldg., CLEVELAND, O.

C. E. KREMER, Attorney and Counselor-at-Law and
Proctor in Admiralty.
Rooms 14, 15 and 16, Bryan Block, 164 LA SALLE ST., CHICAGO, ILL.

CLEVELAND BOOK BINDERY,
196 Seneca St., CLEVELAND, O.

BLANK BOOKS
In Stock and Made to Order.
BINDING
Magazines and Periodicals a Specialty.

T. G. Crosby, C. A. Macdonald,
J. J. Rardon.

CROSBY, MACDONALD & CO.
General Insurance Agents,
RIALTO BUILDING, CHICAGO, ILL

JOHN C. FITZPATRICK, JOHN MITCHELL, JOHN F. WEDOW.
MITCHELL & CO.,
Vessel and Insurance Agents,
508-509 Perry-Payne Building, CLEVELAND, OHIO.
Office Telephone, 737. Residence, John Mitchell, 3506. J. C. Fitzpatrick, 2305,

White, Johnson & McCaslin,
ATTORNEYS-AT-LAW,
—AND—
Proctors in Admiralty,
26-27 Blackstone Building,
CLEVELAND, - OHIO.

JOSIAH COOK, ATTORNEY,
And Counselor at Law and Proctor and
Advocate in Admiralty.
Office, Nos. 12, & 14 Spaulding's Exchange,
BUFFALO, N. Y.
Special attention given to all U. S. court
and admiralty business in all its branches
and the collection of Seamen's wages.

THOS. WILSON,
MANAGING OWNER
WILSON'S TRANSIT LINE.
Gen. Forwarder.
Freight and Vessel Agent.
CLEVELAND, O.

WARNER & CO.,
Vessel Agents and Brokers,
Nos. 511 & 512 Perry-Payne Building,
Superior Street, CLEVELAND, O.

C. F. Palmer. Chas. Hutchinson.
P. J. Minch.
PALMER & CO.,
Vessel Owners and Agents,
(John H. Palmer and John T. Hutch-
inson, Associates.)
Perry-Payne Bldg., Cleveland, O.

W. A. HAWGOOD, C. C. CANFIELD.
HAWGOOD & CANFIELD,
Vessel Agents and Marine Insurance,
604-605 Perry-Payne Bldg.,
Cleveland, - Ohio.
Telephone No. 2395.

W. W. Widdows
ATTORNEY-AT-LAW AND
PROCTOR IN ADMIRALTY
Marine Notary.
ASHLAND, WIS.

C. W. ELPHICKE, A. L. FITCH.
JAS. A. MYERS.
C. W. ELPHICKE & CO.,
Vessel Owners and Agents,
Marine Underwriters,
Rooms 10, 11 and 12, 6 and 8 Sherman St.
WHEELER BLOCK, CHICAGO.
Telephone 1194.

E. T. HITCHCOCK,
Average Adjuster,
184 Main St.,
BUFFALO, N. Y.

Moore, Bartow & Gilchrist,
Ship Brokers & Agents,
Nos. 611 & 612 Perry-Payne Building,
Superior Street, Cleveland, O.

H. J. WEBB & Co.
SHIP BROKERS, VESSEL OWNERS and AGENTS,
Established in 1856. H. J. Webb & Co.
will charter vessels for the lake trade.
Special attention given to chartering ves-
sels in the Lake Superior Iron Ore trade,
both for the season and single trip.
No. 606 & 607 Perry-Payne Building,
Cleveland, O. Office Telephone No. 338,
Residence No. 3228.

J. T. ROSE. FRANK B. LAZIER.
ROSE & LAZIER,
Vessel Agents and Brokers,
and Marine Insurance,
16 Board of Trade,
DULUTH, - MINN.

H. F. SPRAGUE,
Marine Artist,
Studio at Huron, O.
Headquarters at MITCHELL & CO.'S
CLEVELAND, - OHIO.
Oil Paintings of Vessels a Specialty.

Capt. LYMAN HUNT. JAMES P. HUNT.
L. HUNT & SON,
Vessel Brokerage & Marine Insurance,
Room 9, Exchange Building.
Telephone No. 522.
No. 202 Main St., BUFFALO, N. Y.

Established 1857.
THOMAS MARKS & CO.,
Merchants,
Forwarders and Shipowners,
Port Arthur, Canada.
N. B.—Special attention given to char-
tering vessels.

FUELING COMPANIES.

THE SANDUSKY COAL COMPANY,
MINERS AND SHIPPERS OF
THE GENUINE JACKSON HILL AND WELLSTON SHAFT
COAL.
Office with R. B. Hubbard & Son. Telephone 32. Boats Coaled Night or Day.
Dock Office and Derrick, Big Four (C.C.C. & St. L. R'y). Electric Light.
Dock Telephone 163. S. B. HUBBARD, Treas. & Gen. Mgr. Night Telephone 318.
SANDUSKY, OHIO.

To Owners and Masters of Steam Barges.

We beg to call your attention to the fact that we have steam lighters at the ports of Cleveland, Ashtabula and Buffalo, specially equipped for fueling vessels, which enable us to run alongside steamers and fuel them while they are unloading during day or night time. We also have fueling docks at the above ports, at which we can take care of vessels not desiring to avail themselves of the services of the steam lighters. We shall in the future, as in the past, handle nothing but the best grade of Pittsburg coal, and respectfully solicit your patronage.

PICKANDS, MATHER & CO.

THE CUDDY-MULLEN COAL CO.,
Dealers in COAL. Docks at Government Pier, Whiskey Island, and Ad-
joining Globe Dry Dock.

All fully equipped with Revolving Derricks; also, Lighter Carrying Derrick,
and One Hundred Two and One-Half Ton Buckets.
Main Office, 81 Perkins Building, East Side of Main Street Bridge.
Dock Office, 127 West River St., Cleveland, O. Telephone No. 8.
Boats Coaled Day and Night. Docks at Amherstburg.

Ohio & Pennsylvania Coal Co.
FUEL DEPARTMENT.

MINERS AND SHIPPERS,
Youghiogheny and Ohio Steam Coals. Steamboats, Tugs, etc., Coaled day or
night, DOCKS FOOT WEST RIVER STREET. WHISKEY ISLAND GOVERNMENT
PIER and C. & P. R. R. SLIPS. Also STEAM LIGHTER—Equipped with
Revolving Derrick and (100) two ton buckets.

Telephone 1608. Office, 130 West River St., CLEVELAND, OHIO.

GEO. A. SIMPSON, Compass Adjuster.
ALL NAUTICAL INSTRUMENTS CAREFULLY REPAIRED.

Office with UPSON, WALTON & Co., 161 River St., CLEVELAND, OHIO.

ADVERTISING.

If you wish to advertise anything anywhere at any time, write to GEO. P. ROWELL
& CO., No. 10 Spruce St., New York.

EVERY one in need of information on the subject of advertising will do well to obtain
a copy of "Book for Advertisers." 368 pages, price one dollar. Mailed, postage
paid, on receipt of price. Contains a careful compilation from the American Newspaper
Directory of all the best papers and class journals; gives the circulation rating of every
one, and a good deal of information about rates and other matters pertaining to the busi-
ness of advertising. Address ROWELL'S ADVERTISING BUREAU, 10 Spruce St., N. Y.

MILWAUKEE BOILER COMPANY,

[Successor to R. Davis Marine Boiler Works.]

Manufacturers of Marine and Stationary Boilers, Smoke Stacks, Tanks, Etc.
MARINE REPAIRING | Open Day | OFFICE AND SHOPS,
SPECIALLY ATTENDED TO. | & Night. | OREGON BET. BARCLAY & So. WATER STS.
T. L. MCGREOR, Supt. MILWAUKEE, WIS. Telephone 742.

T. S. & J. D. NEGUS

Have the largest and finest stock of Nautical In-
struments and Charts in the United States.

Estimates given for
Outfits of Steamers
and Pleasure Yachts.

Compass Adjusters.

Send for Catalogue and
Almanac.

140 Water Street,
New York City.

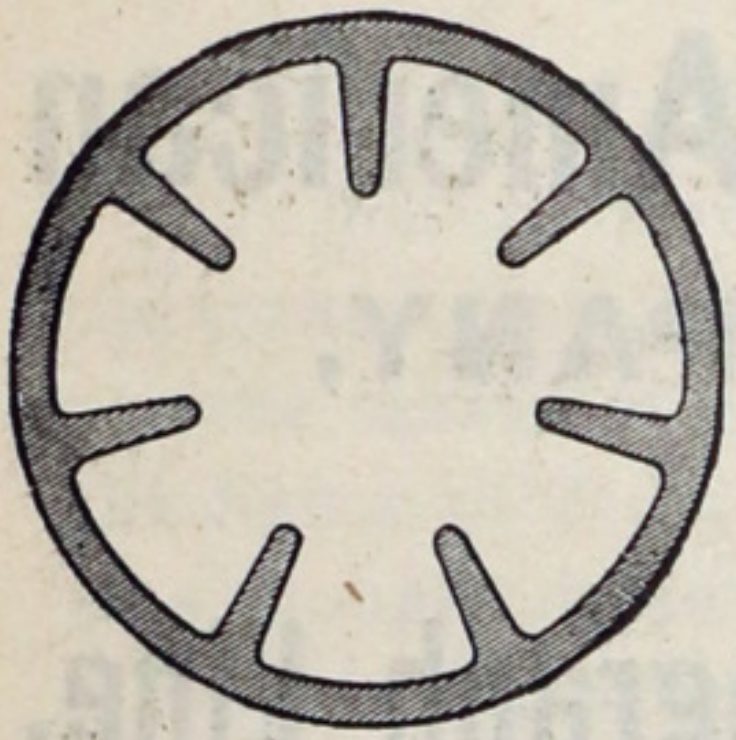
Every attention given to
Trade orders.



S. F. HODGE & CO.

MARINE ENGINES,
PROPELLER WHEELS,
DECK HOISTERS,
MARINE REPAIRS.

320 ATWATER STREET,
DETROIT, MICH.



SERVE'S PATENT

Ribbed Boiler and Stay Tubes

Show an average economy in fuel of 15 per cent.
In steamers, this means not only so much
saving in cost of coal, but additional
freight capacity.

Full particulars on application.

Purves' Patent Ribbed Boiler Furnaces.

Nearly 9,000 Purves' Patent Ribbed Furnace Flues,
of which this cut is a section, are in use in Marine
Boilers. Besides having greater strength to resist
collapse than any other furnace made, they possess
many additional advantages which we shall be happy
to enumerate on application.

CHARLES W. WHITNEY,

Representing Messrs. JOHN WILLIAMS & Co., Liverpool, Sole Agent for the United States
and Canada. 81 & 83 FULTON STREET, NEW YORK.



93 Liberty St. NEW YORK. 113 Federal St. BOSTON.

IMPROVED PUMPING MACHINERY For Every Class of Work. Send for New Illustrated CATALOGUE

MANISTEE IRON WORKS CO.

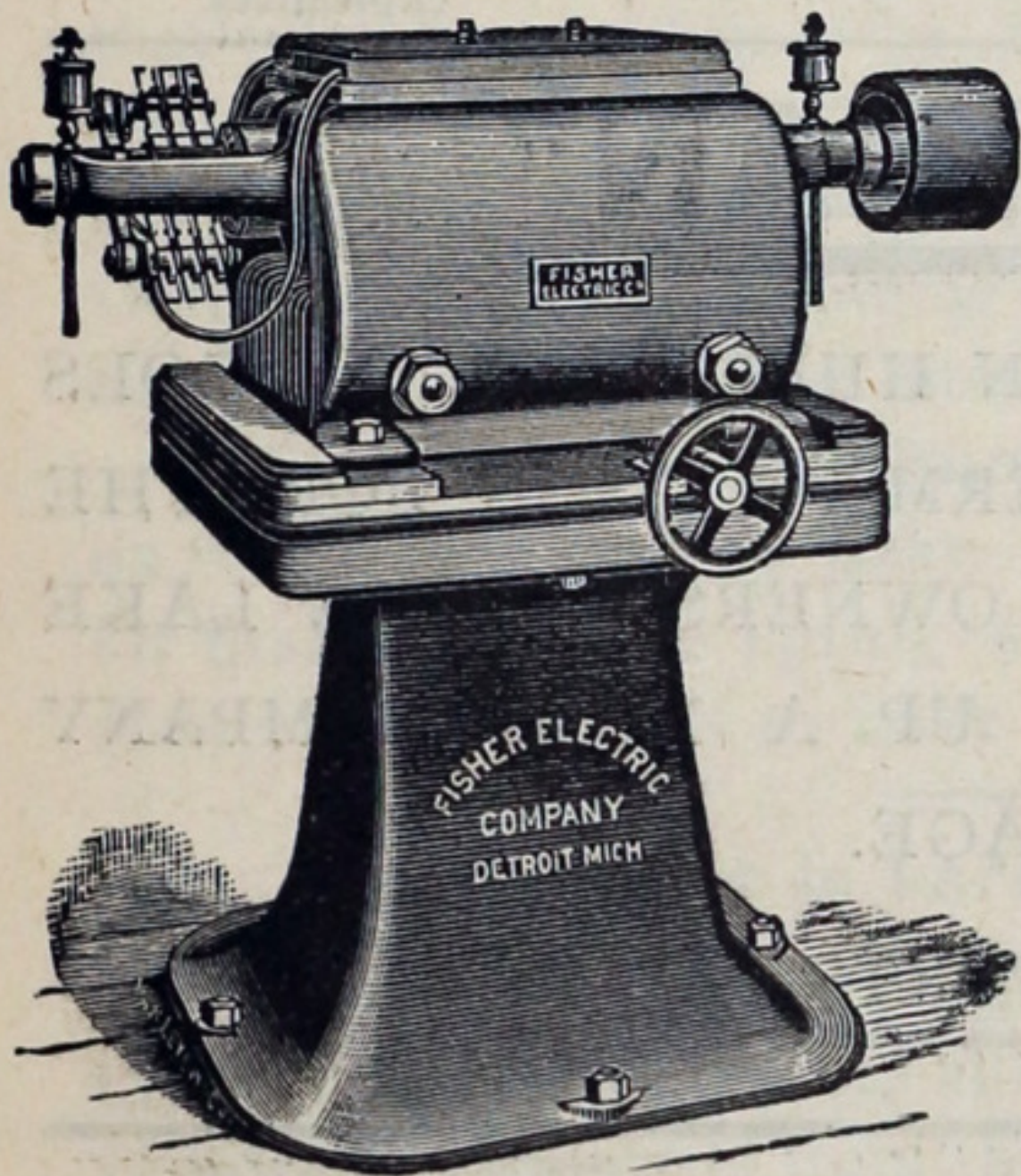
Manistee, Mich.,

MANUFACTURERS OF

Marine and Stationary Engines and Boilers.

Triple Expansion, Fore and Aft, and Steeple Compound
Engines, and High Pressure Engines,

General Mill Machinery and Salt Well Outfits.



THE INCANDESCENT LIGHT

Is the only safe means of illuminating Passenger, Freight or
Excursion Steamers. All other illuminants are dangerous. The
Fisher system is Automatic in its operation, perfect in every de-
tail, and does not require a skilled expert.

FISHER ELECTRIC CO.

183, 185 & 187 Larned St., DETROIT, MICH.

INMAN LINE

OFFICE N.P. DOCK DULUTH, MINN.

B.B. INMAN MANAGER

TUGS
RECORD,
M.D. CARRINGTON
BUFFALO,
J.L. WILLIAMS,
JOE DUDLEY.

TUGS
EFFIE L.
WALTON B.
PEARL B. CAMPBELL,
LIDA,
FIRE-BOAT
DAVID DUDLEY

STEAM PUMPS, HAWSERS, LIGHTERS AND DIVING SUITS FURNISHED ON SHORT NOTICE.

KING IRON BRIDGE & MFG. CO.,

CLEVELAND, O.,

Iron and Steel Bridges, Girders, Buildings and Structural Work of all kinds,
Hoisting and Conveying Machinery for Handling Ore, Coal, &c.

B. D. BABCOCK, President. W. E. LUDLOW, Vice-Pres. & Gen. Mgr.
W. R. HUNTINGTON, Sec'y & Treas.

THE LUDLOW MANUFACTURING CO.

Office, 121 Superior St., Room 12, CLEVELAND, OHIO,

MANUFACTURERS OF

The Ludlow Bucket,

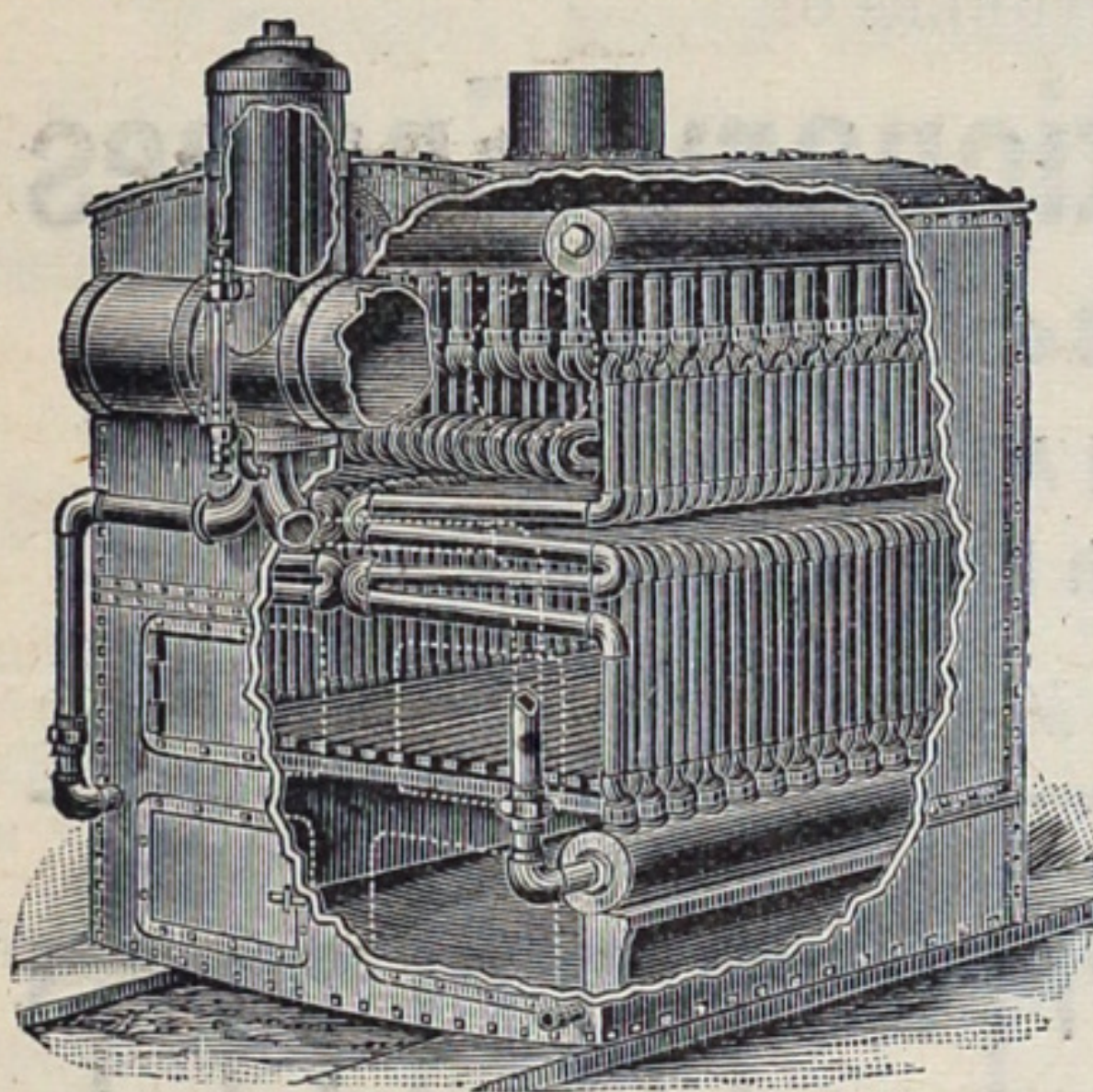
FOR THE HANDLING OF

COAL, ORE and STONE.

CLEVELAND, O., Nov. 18, 1891.

TO WHOM IT MAY CONCERN:—We have had four of the one and one-half ton and four of the two-ton Ludlow Buckets in use on our coal docks since July 5, 1891, and have had no repairs whatever to make on them, with the exception of replacing one defective stem. The Buckets do the work to our entire satisfaction, and when used in connection with the Ludlow Patent Trip, which has been in use on one of our derricks for the past six weeks, they are, in our opinion, away ahead of any other coal buckets we have ever seen used.

J. S. ASHLEY, Agent,
New York and Cleveland Gas Coal Co.



ALMYS'S PATENT SECTIONAL WATER TUBE BOILERS

FOR

:: MARINE and ::

STATIONARY WORK

Manufactured by
ALMY WATER TUBE BOILER CO.
Providence, R.I.

"The use of boilers of the coil type in vessels of small displacement and enormous power is already a necessity, and it will not be many years before their use will be general in all steam vessels."—Engineer-in-Chief Melville, U. S. N.

OMAR D. CONGER.

CHILTON P. CONGER.

Conger & Conger, Attorneys and Counsellors at Law,

No. 45 Corcoran Building, Washington, D. C.

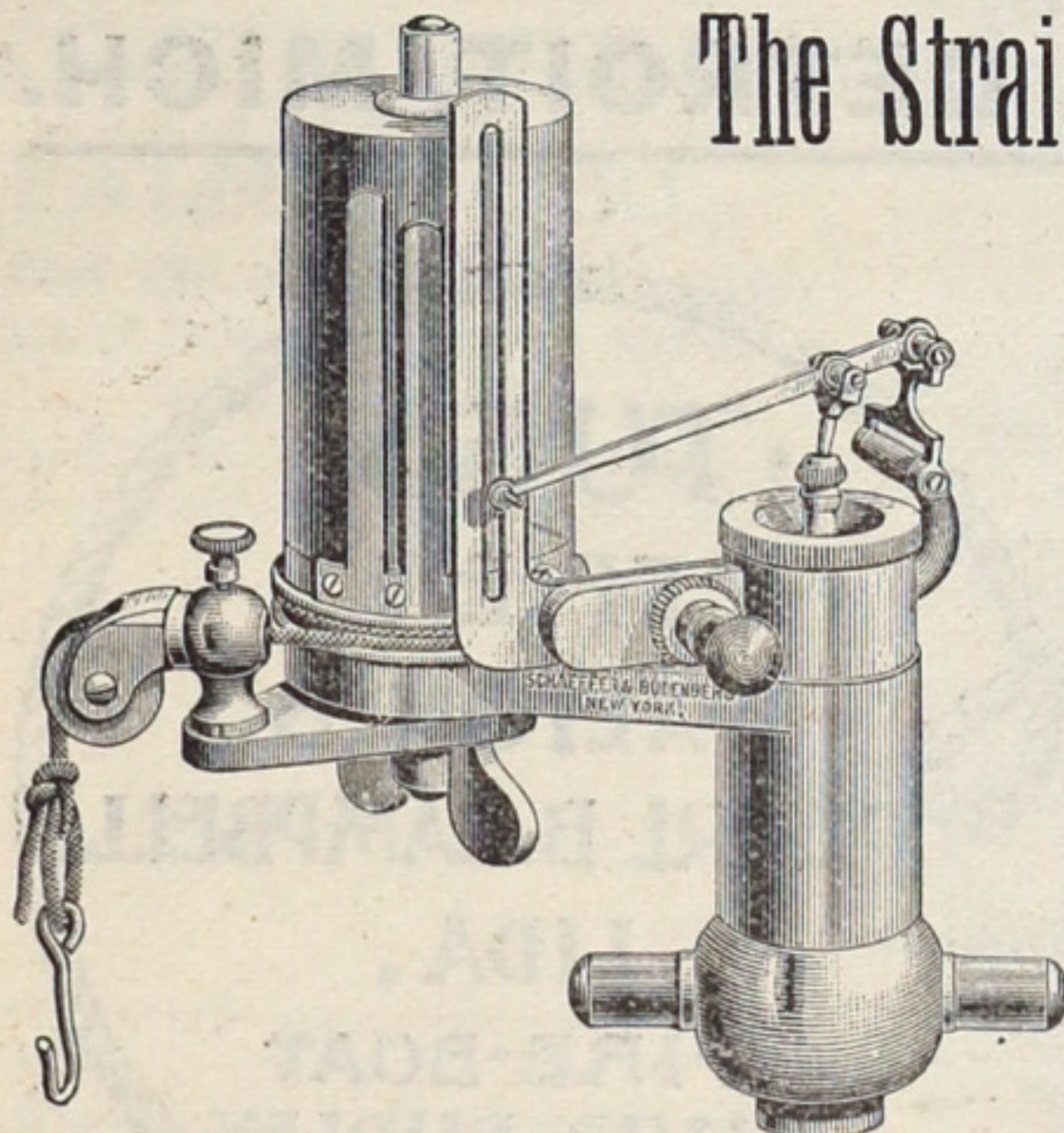
We make a specialty of all Marine and Shipping Business before the Treasury Department and Congress. Patent Business. Practice, Court of Claims and U. S. Supreme Court.

PATENTS

Patents Obtained in the UNITED STATES and FOREIGN COUNTRIES.

M. D. & L. L. LEGGETT

Attorneys at Patent Law,
Masonic Temple, CLEVELAND, OHIO.



The Straight "LYNE" Indicator,

Adapted for Engines of all speeds.

For Simplicity, Reliability,
Excellence of Workman-
ship, it has no superior.

Sold at a Moderate Price.

Send for Descriptive Catalogue.

SCHAFFER & BUDENBERG,

Works: Brooklyn, N.Y. Sales Rooms:
No. 18 So. Canal St., CHICAGO. No. 40 John St., NEW YORK.

William V. Brigham, Pres't,
Boston, Mass.

Edward L. Suffern, Vice-Pres't,
New York, N. Y.

Midland & Southern American TELEGRAPH COMPANY,

CONSTRUCTING THE

Pan American Direct Telegraph Line, Capitalized at \$500,000,

Offer a Limited Amount of the Stock at Par, \$10 a Share.

L. C. WOLKINS,
Secretary.

258 Washington St.,
BOSTON, MASS.

The Jenks Ship Building Co. GENERAL SHIP BUILDERS,

Correspondence Solicited. PORT HURON, MICH.

MECHANICAL ENGINEERS & DESIGNING ARCHITECTS.

L. C. WOLKINS,

Room 29, 258 Washington St., BOSTON, MASS.
Superintends construction of engineering works. ARCHITECT AND ENGINEER. Examines properties for capitalists.

"THE MICHIGAN"

ISSUES POLICIES ON HULLS AND CARGOES
ON FAVORABLE TERMS. IT IS FOR THE
INTEREST OF THE OWNERS OF THE LAKE
MARINE TO BUILD UP A HOME COMPANY
BY THEIR PATRONAGE.

AGENCIES AT PRINCIPAL PORTS.

Insurance Co. of North America.

INCORPORATED 1794.

LAKE MARINE DEPARTMENT, GEO. L. McCURDY, Manager, Chicago, Ill.

CHARLES PLATT, President. WILLIAM A. PLATT, Vice-President.
EUGENE L. ELLISON, 2d Vice-Pres't. GREVILLE E. FRYER, Sec'y & Treas.
JOHN H. ATWOOD, Assistant Secretary.

Capital, paid up in cash..... \$3,000 000.00
Assets..... 9,278,220.00

MAGNESIA STEAM PIPE and BOILER COVERING.

IS ON NEARLY
300

STEAM VESSELS.

SECTIONAL, BLOCK and PLASTIC FORM.

Address, **MACAN & CO.,** 237 Bank Street, CLEVELAND, OHIO.